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MONITORING TIMES

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Sunrise at
Monument Valley, Arizona
(Photo by John Bailey)

The Sony PRO80

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The New Shortwave Portable
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From the Publisher:

ERGONOMICS

Don't bother to look it up in your dictionary; it probably won't be there. and it would seem that most Japanese radio manufacturers have never heard of it either. Ergonomics refers to comfort engineering, the art of designing a piece of equipment to fit the tactile (touch) and visual needs of the operator.

Nature has provided man with an opposable thumb whereby he can grasp objects like radio knobs. For decades, radio knobs have been easy to manipulate. Now, for some reason knwon only to the Tokyo equivalent of Madison Avenue, knobs have started disappearing, replaced by slide controls and membrane keypads.

I have not recently examined the hand of a Japanese for the presence of a thumb, but I am getting very suspicious.

As if that anatomical assault were not bad enough, my eyesight is also being challenged. Keypad buttons are growing tinier and printed legends are ofter small, unilluminated, insufficiently contrasted with their backgrounds, or otherwise difficult to read.

My mind's eye drifts to a time in the not-too-distant future where a receiver or other electronic instrument sits on a shelf, resembling a formless mass, operated by a shout or, perhaps, a swift kick. Come to think of it, some of the equipment I have seen lately looks like a prime candidate for a swift kick.

A Welcome from the Publisher

It is always a pleasure to welcome new friends at *MT* headquarters. This month we introduce two new writers on our pages.

Bob Kay is inaugurating our Scanning column. Well equipped for the task with five scanners and an ICOM R71A for shortwave, Bob uses a Grove Scanner Beam and two Grove OMNIs for reliable VHF/UHF coverage.

An avid runner (3 miles a day!), Bob is an award-winning civic leader as well. Professionally, he is involved in guidance missile system development as a civilian working for the Department of Defense.

Dave Jones brings his expertise in federal government and military monitoring from his editorship of the All Ohio Scanner Club column. His professional employment takes him all over the country where he continously monitors and verifies his exhaustive files which will be shared with fellow fed/mil enthusiasts via *MT*'s new Federal File column.

MT continues to grow by listening and responding to requests from our readers. Let us know how you like our new columns and what areas need further development.

Bob Grove

On the Cover: Monument Valley -- symbol of the "wild west" -- exemplifies the unbounded spirit of modern-day "freebanders." Photo and cover by John Bailey of Owassa Graphics, Murphy, NC.

Inside this Issue

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The LIFE and DEATH of a Pirate

by David Klopfenstein

Many pirates, past and present, have been community-based stations serving an audience that lacked such a broadcaster on a legal level. "Laser 558," "Zoom Black Magic," and WIBS" all were bridging a gap in the markets they served. Such a situation existed in Portland, Oregon, where not one of the three album-oriented rock (AOR) stations played "heavy metal" or the new "skater music." Filling that hole was the philosophy behind the creation of KCOR, "Rock-16," on 1630 kilohertz AM.

A Pirate is Born

On Wednesday, April 15, 1987, "J.R. Psycho" went on the air with a small stack of compact discs and about one and a half watts of effective radiated power (ERP). He had connected his Sony "Discman" and an old microphone to his tape deck. From there, J.R. fed the music and voice into his stereo, where he controlled the levels with the volume knob. This clumsy audio was fed into a not-yet-perfected Allied 93320 modulator and into his early 1950s Lysco "Transmaster" ham rig. KCOR's overmodulated signal was underpowered, and it only covered a few miles, but it was enough to blanket the nearby high school.

For the next few days, "Rock-16" operated from 7:00 a.m. to 12 midnight so that J.R. could better estimate the station's range. By riding up and down the streets of the neighborhood with his small Sony AM stereo (SRF-A100) tuned to KCOR, he found that although weak, KCOR could be heard over two miles away. Improvements would be needed, but KCOR already had about 25 regular listeners who braved the static to hear *their* kind of music.

Those early broadcast days were carefree for J.R., since operating the station did not entail very much. A typical day began at 6:45 a.m. with the blaring of the alarm clock. Sleepily, J.R. would warm up the transmitter and modulator, making sure all the tubes were creating that reassuring orange glow. At 7:00 a.m., he signed on, setting the Discman in the "random play" mode and left for school. This was how J.R. was able to run KCOR while he was taking classes -- or cutting them to drive around and see how far his station could be heard.

Upon his return from school, J.R. would change the disc and give an ID as "K-C-O-R, Rock-16, your emancipation station." He routinely replaced the discs when they were finished and gave the station ID's every five songs or so until midnight. At the 12:00 a.m. sign-off, J.R. made a formal goodbye to his listeners, shut everything off and went off to bed for his six hours and forty-five minutes of "downtime." Such were the early days of "Rock-16."

Growing Pains

By April 20, J.R. had a regular broadcasting schedule. 3:00 p.m. to midnight daily, sometimes later on the weekends. In April, J.R. also set official standards for KCOR by not slandering listeners or using profanities on the air--in song or voice. Although, at this time, he was the only person to keep in check, this policy became important later on as more people joined the program. J.R. also wrote down requests during school to play when he went home and fired up "Rock-16." KCOR's popularity increased and J.R. began to find new and interesting ways of giving the station publicity. Posters were drawn up and put in and around several of the high schools within earshot of "Rock-16." He enjoyed success with these ideas and soon made plans to revamp the station.

At this time, a typical day at KCOPR consisted of more than just the afternoon to evening broadcast. During school, J.R. not only solicited music requests and taped posters up in the halls, he also wrote down the dates of upcoming dances and other functions, "Rock-16" was made available to student government candidates for campaign related public service announcements. This publicity work, of course, was above and beyond J.R.'s homework and regular school activities.

As soon as the dismissal bell rang, J.R. rushed home and warmed up the tubes of the transmitter and modulator for the impending 9 hour one-man show. And, at precisely 3:00 pm, J.R.'s voice proclaimed it was the beginning of another broadcast day at "KCOR, Portland's only real rock station." By now, he was comfortable and jocked between virtually every song, giving ID's and music news

For the most part, his equipme didn't cause any problems, but t compact disc player still skipp occasionally and J.R. had to come the air apologizing for the proble When the shift ended, as usual, bid farewell to his listeners, yank the plug and went to bed. As he l there in the dark, he decided that he was to pull the whole shift eve night, changes at the station must made.

By way of improvements, J.R. fix up a quarter wave long wire antenn improved his ground and adjust the modulation to an acceptab level. He also purchased mo compact discs and borrow cassettes from his friends a listeners.

During May, J.R. pursued a few mo ideas, including a five channel mix with a microphone from Rad Shack. He also bought as AD compact disc player to allow him t professional sound of segues. addition to these items, KCOR ca across a tape of sound effects and recording of silly dubs, celebri goofs and comedy. "Rock-16" al began to play commercials from ea days of radio. This helped KCO gain a light-hearted format and good rapport with its now 3 listeners.

J.R. was managing fairly well on h own with KCOR and he was hap with his nightly efforts on 1630. H sights, however, were on a high medium, or wavelength at least. An after he weighed the possibilities, came up with a shortwave outlet f KCOR. In late May, with some he from "Ed," his station enginee "Free Radio Northwest" was bor

On Sunday, May 30, at exactly 1: p.m. Pacific Daylight Time, J.R. beg the "Free Radio Northwest" interv signal, a music box version of the o syncopated folk song, "Grandfathe Clock." J.R. used the same ha transmitter but this time on 138 kHz in the 22 meter band. "FRN' offering was "Hip Tracks," a progra featuring a popular album in t United States. The particular sho was on the Irish group, "U2's" late and number one LP, "The Josh

---

David Klopfenstein, a broadcasti student with Portland Public Rad 1450 KBPS, has been a shortwa DX'er since 1985, and a broadca band DX'er since 1983. He is curren a member of SPEEDX, IRCA a ANDEX and serves as a cad communications officer for his Ci Air Patrol Squadron. In addition, writes and edits for his high scho paper.

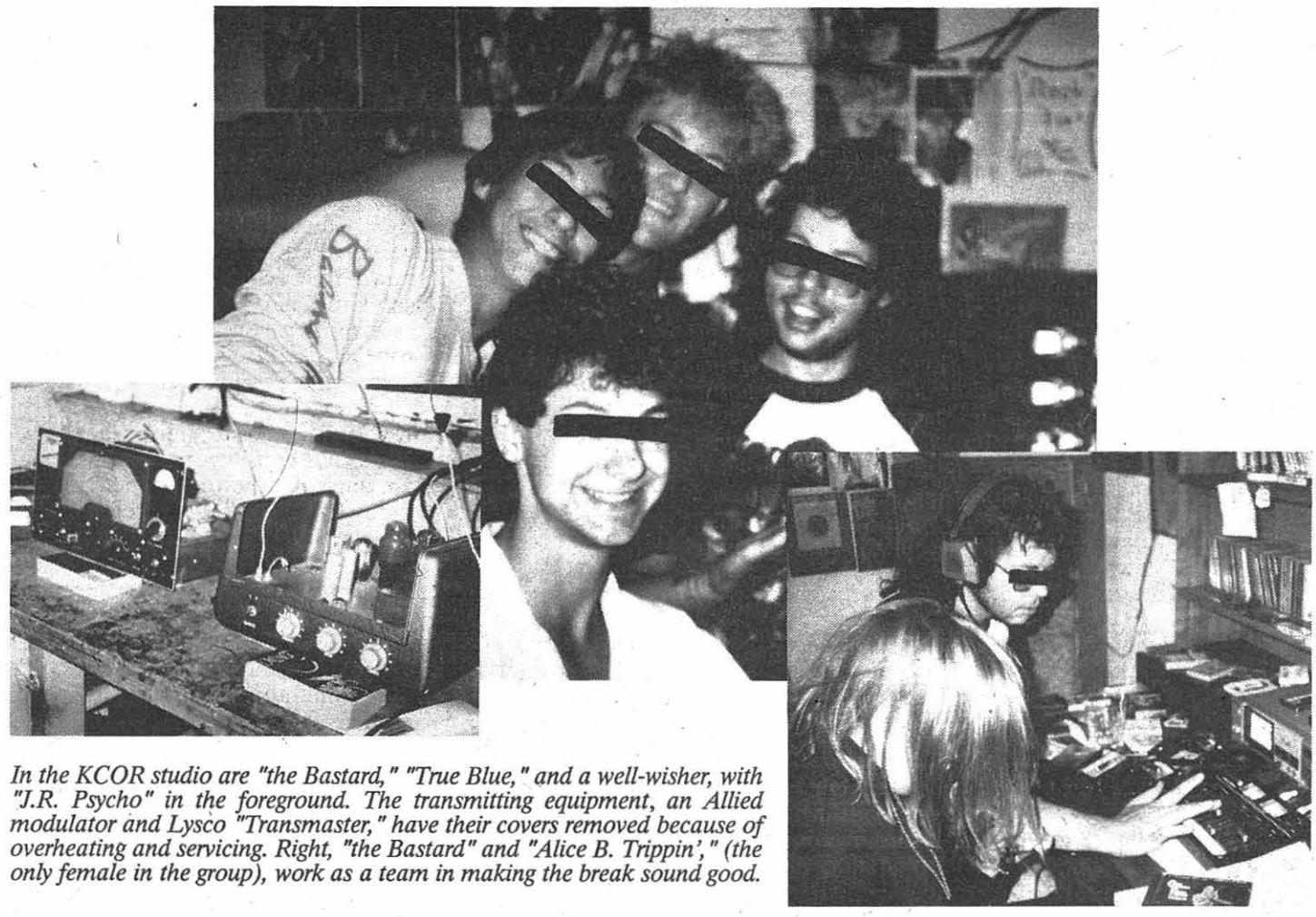
Tree." Because J.R. wanted to give the impression of being a shipborne pirate in international waters, he used numerous sound effects and played with the levels to simulate the swinging of the microphone. After "Hip Tracks" finished the feature album, the remaining ten minutes were polished off with some popular music from the Republic of China (Taiwan). At the top of the hour, "FRN" said goodbye with the interval signal as J.R. gave QSL information. The transmitter was shut down at 3:05 pm and the 1630 crystal replaced for KCOR sign-on. This made "Free Radio Northwest" one of shortwave's shortest lived and rarest broadcasters. He was still running only a watt and a half.

Coming of Age

June brought additional improvements to the station, including an upgrade from the former 5 watts peak envelope power (PEP) to a 15 watt PEP output with 5 watts of effective radiated power (ERP). Along with the increase in power came a boost in staffing, with several disc jockeys joining the KCOR team. Although there is controversy over who was the first new voice on the lineup, everyone agreed the station sounded a little fresher with more than one jock. The news announcers aliases were "Rockin' Richie," "Rick Rol-l-l-l," "Alice B Trippin'" and "Love Stallion," as well as "Phil Poser," "The Bastard," "Doctor Thrash" and "True Blue," and last but not least was "Eric--Man of the Hour." Along with the new deejays came their collection of compact discs and cassettes helping to expand even further the range of music KCOR played.

The nine new disc jockeys generated increased publicity and led to the inclusion of the two pay phones at the corner "7-Eleven" for request lines. With "Rock-16" deejays "on-line" at the phone, listeners could have a personal visit or--as in the case of broadcast band DX'er, Pat Martin of Seaside, Oregon--the ability to get the QSL address without wading through QRN. This also gave the jocks something to do when they weren't busy at the studio.

After school let out on June 9, J.R. became aware that although he had a fairly clean operation, the Federal Communications Commission might ask him to shut down. In order to reduce this risk, he changed the KCOR broadcast schedule from the former 3:00 pm to midnight to a new 5:00 pm to midnight. J.R. and the rest of the gang signed on after the FCC field office downtown closed at 5:00 and kept an eye out for, as J.R. put it, "a large white van, bristling with antennas."



In the KCOR studio are "the Bastard," "True Blue," and a well-wisher, with "J.R. Psycho" in the foreground. The transmitting equipment, an Allied modulator and Lysco "Transmaster," have their covers removed because of overheating and servicing. Right, "the Bastard" and "Alice B. Trippin'," (the only female in the group), work as a team in making the break sound good.

The typical summer vacation broadcast day was a radical change from KCOR of earlier days. No longer was the radio station a quiet operation in J.R.'s basement--it had become a full-fledged broadcaster with logs, airshifts and posted station policies. The days sometimes began early for J.R. and the crew, but most of their mornings were spent asleep, reviewing a new album or mulling over the latest music magazine for the evening show. Some of the regular deejays had slept overnight on the couch or on the in-studio bed. Once everyone was awake, though, the hustle and bustle of preparation began. Well, as soon as the crew munched their "Froot Loops" or slurped their coffee.

After lunch, KCOR became a "hang-out" for those impatient to hear the evening broadcast. J.R.'s speakers blared all afternoon as the kids came and went in a seemingly never-ending cycle. Toward the 5 o'clock sign-on, the place began to clear and the "Rock-16" staff readied themselves for the seven hours ahead. Soon, KCOR formally signed on and the program began.

Most nights had three shifts, with J.R. on backup in case the assigned jock didn't show. Every shift was filled with requests and foolishness ranging from impersonations of Jim and Tammy Bakker to satirical PSA's from Arlington National Cemetery. Round 11:30, the tone mellowed and by sign-off, everyone was ready and waiting to sleep up for the next day. The "good nights" were exchanged and KCOR turned in.

The days and nights at "Rock-16" weren't always good. Several times someone swore on the air and on one occasion, a KCOR "groupie" showed up stone drunk. However, J.R. took these situations in stride and made sure there would be no repeat offenders. He was very particular about what was said over KCOR and a couple of wrists were slapped--the groupie was not allowed to return. All of the crew knew that "Rock-16's" survival was pivotal upon listener complaints to the FCC and were forced to act accordingly.

KCOR Signs Off

J.R. had reached the peak with KCOR. He had accumulated a sizable group of listeners, nine enthusiastic disc jockeys and a large library of music. The station was doing well, but based on his own common sense, he made an intelligent and difficult decision. Reasoning that it was better to quit while he was ahead, J.R. scheduled a permanent sign-off and vowed to stick to it.

On Friday, June 26, J.R. announced at sign-on that KCOR would sign-off for good at midnight on June 28. He would, however, be broadcasting non-stop until that time. The next three days were fast and furious for the fatigued crew and equipment. Hundreds of requests came in and the station was busy all night, both nights, playing them.

At 12:15 on the morning of June 29, 1987, the last four deejays still awake passed the microphone around one last time. "J.R. Psycho," "The Bastard," "Rockin' Ritchie" and "Phil Poser" thanked everyone and each other for the great time they had at "Rock-16." Finally, after several goodbyes, Jimi Hendrix played the "Star Spangled Banner" and at 12:19 a.m., KCOR became radio history.

KCOR "Rock-16" AM had 76 days of operation, 500 listeners and quite a few reception reports from DX'ers. During its operation KCOR served its chosen audience without a single complaint to the FCC or similar authorities. If you think you may have heard them on either AM or SW, reception reports and inquiries about the station can be sent to KCOR, 4038 Northeast Halsey, Portland, Oregon 97232,

If this is a valid example of what Bruce Quinn's free broadcasters will be in the future (see *Monitoring Times*, July 1987), his arguments may be true. Pirates and legitimate stations alike will just have to wait and see whether or not the FCC will even cater such a proposal. And, if they do, the outcome is not guaranteed to either party. ■

(Photos by the author)

Wild West

By Jock Elliott

If you think the frontier disappeared when things quieted down in Dodge, or when the law came to Yellowknife, just tune your receiver between 26 and 28 MHz and have a listen. These are the badlands, hombre, the wild west of radio.

It's the home of unlicensed operators, RF gunslingers packing beam antennas and powerful linear amplifiers. They call it the "freeband" or the "extra channels."

Whatever your bent, the freebands can be mighty entertaining to monitor. Here you will find almost everything you can imagine: experienced operators with skill and polish enough to make an Extra Class amateur proud, and sophisticated discussions on radio technology, agriculture, politics and more.

It is also an insane asylum, with someone endlessly chanting "*Ray dee oh, ray dee oh*" and others spitting out the vilest of racial and geographic epithets to no one in particular.

The frequency range that is home to this diverse population is sandwiched around the legal citizens band frequencies, 26.965 to 27.405 MHz, and that's where the story begins.

As the CB craze mushroomed in the 1970s, the legally assigned channels began to get overcrowded. The Federal Communications Commission responded by expanding the frequency assignment to 40 channels. Still, the scope of the fad was such that the bands remained overcrowded.

At about this point, a number of technically-minded CBers discovered that their transceivers could be easily modified to operate in a range of frequencies that extended outside those assigned by the FCC. For example, with the addition of two wires and a couple of switches, an SSB transceiver such as the Uniden Madison can be made to operate on 15 channels below channel one and 55 channels above channel 40. The frequencies range from 26.835 MHz right up into the 10-meter ham band.

Other radios require the replacement of microchips and/or crystals, but by and large, the changeover can be done easily by any competent technician.

In twos and threes, CBers put the "extra channels" in their radios to escape the noise and confusion, a freeband was born. And although t CB craze has long since subsid freebanding persists.

Freebanders appear to be dedicated bunch: at the first hint good propagation, you'll find dro of them working to establish out state or out of country contacts. T results are often impressive. O Florida operator has contacted countries so far *this year.*

The Federal Communications Comm sion, however, isn't impressed.

Elliott Ours, Chief of the FC Enforcement Branch, says, "Anyo who persists in operating out frequency is eventually going receive some attention from us."

Rick Engleman, the FCC's Chief Inspections and Investigations s he sees the free banders as a probl because of the actual or potent interference they may cause w legitimate users of the frequenc and with other electronic devices li TVs and stereos. Last year, the F received between 28 and 29 thousa interference complaints. Fifty sev percent of them were caused CBers.

Legally, a CBer may transmit up t watts AM and 12 watts PEP sin sideband. Many operators within t 26 to 28 MHz range, however, ha boosted their power by modifyi ham equipment (capable of runni 150 watts or so), running so-call "export" radios that were design for other countries and are illegal own in the U.S., or installing lin amplifiers with power ratings up several thousand watts.

"Excessive power is perhaps more a concern than out of band ope tions because many of our enfor ment activities are primar complaint-driven," Engleman sa "But I wouldn't want anyone to g the idea we are going to look t other way just because we find th an operator is working illeg frequencies at low power."

Attracting the attention of "Un Charlie," as the FCC is known in t freeband community, can be singularly unpleasant experien fines start at $750 and can go as hi as $2,000 for even a first offen There are no warnings.

Recently, for example, the FCC fie office in New York City levied mo

Radio

Adventures in Freebanding

than $10,000 in fines on gypsy cab companies that were operating in the free band, using linear amplifiers and illegal export radios. The companies had attracted the attention of the FCC because of complaints of TV interference.

With perhaps hundreds of thousands of free banders and only hundreds of FCC investigators to enforce the rules, Engleman likens the situation to highway speeding: "There are lots of speeders, and we're not going to catch all of them, but we are going to catch some." To some extent, his analogy, operating out of band *and* with excessive power is somewhat like speeding and driving recklessly -- it's more likely to attract attention.

But there is another side to the freeband story, according to Bill Cheek, a.k.a. "Dr. Rigormortis," publisher of the *Eleven Meter Times and Journal* (a national newsletter for high performance CBers and freebanders). As a professional radio communications engineer and consultant, Cheek carries an impressive list of credentials, including membership in the Radio Club of America, the Institute of Electrical and Electronics Engineers, the Instrument Society of America, the National Association of Radio and Telecommunications Engineers and American MENSA.

Cheek has thought long and hard about the free band issue, and he takes exception to the FCC's position.

"In terms of operating out of band at low power -- and at high power if it is done correctly -- freebanders do virtually no harm. That's because there are vanishingly few legitimate users in that portion of the spectrum. Of the few that are licensed to operate there, such as the Civil Air Patrol on 26.620 and some mobile-to-broadcast links for local TV stations, most have moved to VHF or UHF where reception is more reliable for short-range communications," he says.

Cheek adds, "As to the issue of enforcement, you might as well pass a law that says the sun won't come up tomorrow and try to enforce that. The reality is that, as the DX cycle favors long-distance propagation on the bands, more and more operators are going to move into the extra channels for the same reason that they did ten years ago -- DX congestion will render CB channels 1-40 unusable unless you operate at very high power."

Right now, Cheek estimates that fully half of the millions of CB operators in the United States have freeband capabilities, and ten to twenty-five percent of them are using the freeband on a regular basis.

In regard to high power operations, Cheek admits there is a problem. "There is no doubt that improper high-power operations probably cause more interference problems than the FCC realizes." But the solution, he feels, lies in making sure that linear amplifiers, export radios, and ham rigs are operated properly. to this end, he has supported a non-code technical license for high-power freeband operations.

But why don't freebanders become hams and legitimize their operations?

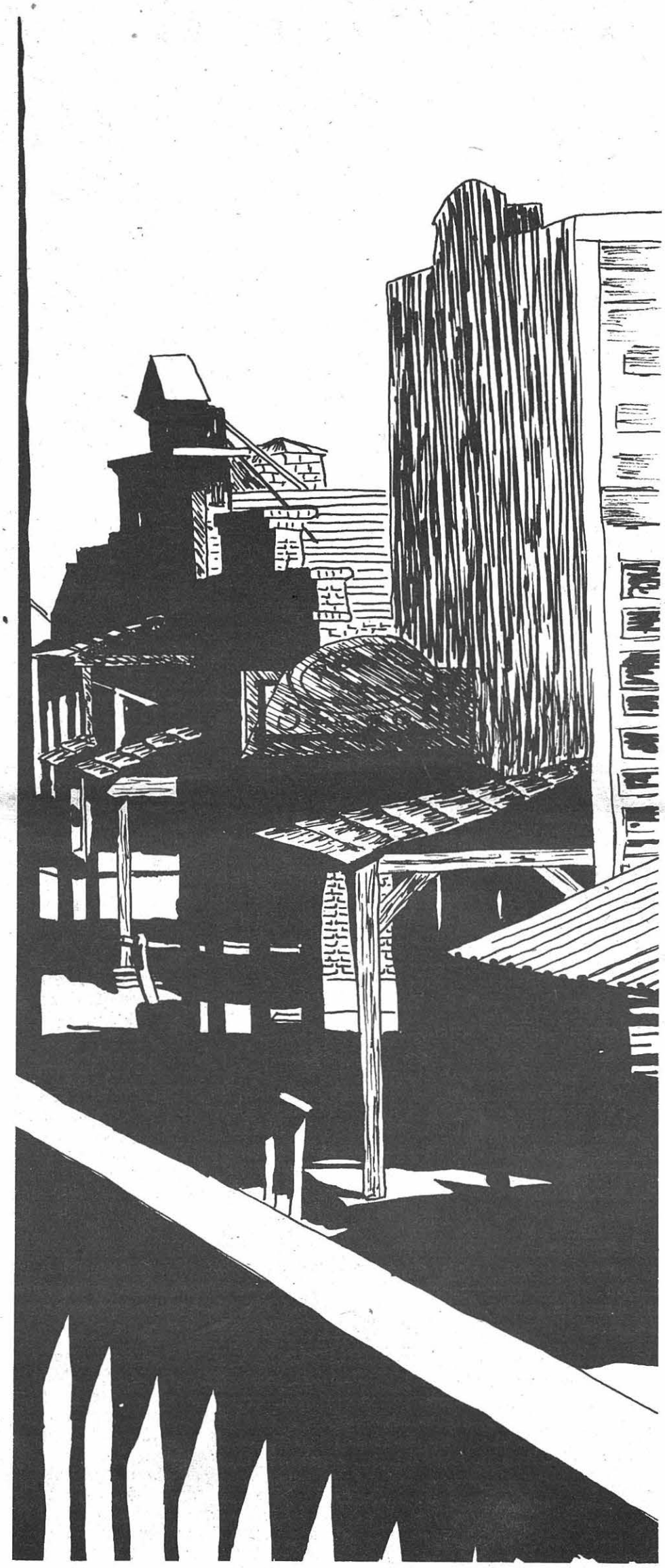
"Most freebanders have absolutely no interest in learning Morse Code. Otherwise, I think many would be willing to study for a license," says Cheek. Interestingly, though, a surprising number of freebanders are also hams.

There is, according to people like Cheek, a more important issue at stake than simply playing radio. "As a publisher and citizen," says Dr. Rigormortis, "I support the Constitution and the Bill of Rights. The founding fathers believed that taxation without representation was tyranny. Now notice this: no one elected the people at the FCC. They are making rules regarding use of the airwaves without the people's representation. Congress, which does represent the people, does *not* vote on the rules. Due process isn't involved, and I question the FCC's authority to say that freeband radio is illegal."

"In short, a kind of peaceful rebellion has taken place. The airwaves belong to everyone, and we, the people, have taken back control of the free band by right of eminent domain."

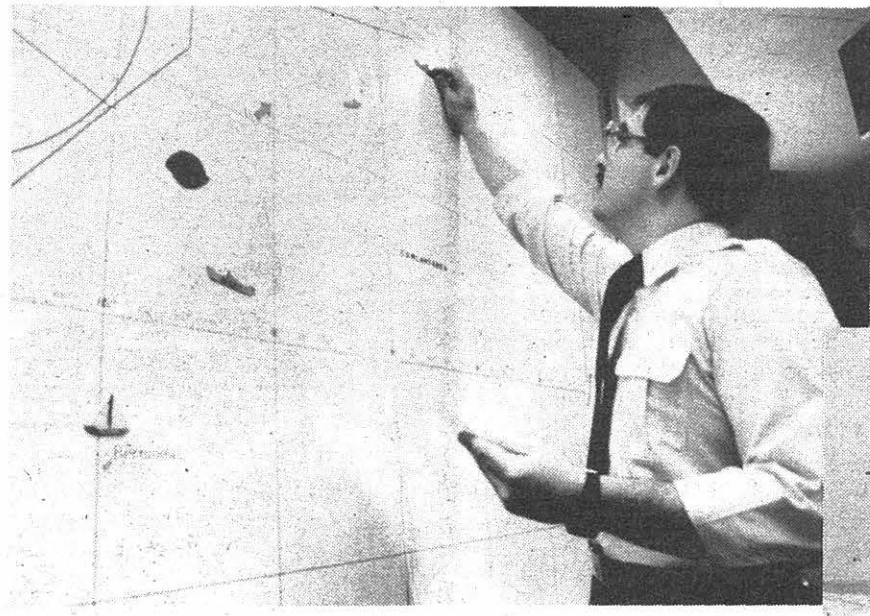
Whether the issue of freebanding as legal vs illegal or people's rights vs the tyranny of big government, the freeband appears to be here to stay, pardner. Welcome to the untamed frontier of radio. ■

Want to know more about freeband action? Write to Eleven Meter Time and Journal, P.O. Box1019, Lemon Grove, CA 92045. Send an SASE for info, $2.00 for a sample copy, or $15.00 for a one-year subscription.



When the Waves turn Minutes into Hours ...

The U.S. Coast Guard is Listening and Ready to Help -- And you can too!



U.S. Department of Transportation

United States Coast Guard

An exclusive interview by Jock Elliott with Lt. Commander Dave Smith, Chief of Telecommunications Branch for the Atlantic Area of the United States Coast Guard.

MT: Lt. Commander, what exactly is your job?

Smith: As Chief of Telecommunications Branch, I have responsibility for overall management of Coast Guard communications, including radio communications, in the Atlantic Area. The Atlantic Area covers the Eastern half of the country, from the North Atlantic to the Caribbean. The Western half of the country, as well as Alaska, Hawaii and some of the islands in the Pacific is the responsibility of the Coast Guard's Pacific Area Command.

MT: At any given time, how many people do you have monitoring various radio frequencies?

Smith: Well, over 100, but it changes. First, it would probably be useful if you understood that we have an extremely varied mission. The Coast Guard has responsibilities in search and rescue, law enforcement and maritime defense of the coasts. We call it "save 'em, seize 'em or sink 'em."

MT: How are you organized?

Smith: Under the Atlantic Area there are five major districts in Portsmith, Virginia; Boston, Massachusetts; Miami, Florida; New Orleans, Louisiana; and San Juan, Puerto Rico. There are similar districts in the Pacific. Each district is a major research and rescue coordination center. Within each district is a series of groups--some 50 of them Coast Guard wide--that are responsible for smaller geographic areas such as a portion of the New Jersey Coast. Finally, within each group there are a number of individual search and rescue stations, equipped with boats, planes and helicopters.

MT: That seems like a lot of organization.

Smith: It is, but it is necessary to provide the coordination and allocation of resources that we need to do our job. For example, do you remember the Russians who were rescued from a freighter a while back?

MT: You mean the ones who eventually were brought to the White House to meet the President?

Smith: That's right. Well, they were aboard a bulk grain carrier that suddenly began to sink rapidly. Their distress call was first received at the Cape May Group in New Jersey. But they were sinking fast, and Cape May didn't have the large helicopters that were need for the rescue. So word was passed up the chain of command to the Atlantic Area command, which contacted Boston. The choppers that safely lifted all 34 Russians off were actually dispatched out of Cape Cod. Now, if Cape May had to contact all the other groups to find out who had large helicopters available, it's possible that we wouldn't have gotten to the freighter on time. So, yes, there is a lot of organization, but it is there for a purpose, and most of the time it serves pretty well.

MT: What about your radio facilities and the frequencies the Coast Guard listens to?

Smith: Let's start at the bottom. At several places along the coast we have stations that "guard" the 500 kHz international distress frequency. This is the old fashioned SOS/Morse code frequency that was used back in the days of the Titanic. Most of these stations have 300 ft. towers and 2 kilowatt transmitters. Under the worst conditions, the range of these stations is about 300 miles. Incidentally, when I say that we "guard" a frequency, that means we have someone listening to it 100 percent of the time.

The next frequency we guard is 2.182 MHz upper sideband. The stations are usually equipped with 1 kilowatt transmitters, we figure that they are good for reliable communications for about 70 miles. Of course, when conditions are good, we can do a lot better than that.

MT: Don't you put out "notices to mariners" on that frequency?

Smith: Well, actually, we call on 2182 to announce that there will be a notice to mariners and request that they listen to the notice on 2670. That way, we can keep 2182 clear.

Another frequency that we guard is 8364, which is the transmitting frequency of the old "Gibson Girl" lifeboat radios. These are old hand-cranked CW radios with the antenna pulled aloft by a kite or a balloon. There are a surprising number of vessels equipped with these devices, so we listen there.

MT: What about VHF?

Smith: We also guard 158.6 MHz FM, which is marine channel 16. Each of our research and rescue stations is equipped with 50 or 100 watt transmitter, and because we have taken care to locate antennas on mountain tops and high buildings, we actually have continuous coverage on this frequency around the lower 48 coast line out to 20 miles at sea. We also have continuous coverage in Hawaii and some coverage in Alaska. That coverage assumes the worst case: we can hear a 1 watt signal from a handheld transceiver with a unity gain antenna only 6 feet above the sea. If you have a sailboat with an antenna on top of the mast as a 25-watt radio, we can hear you a farther away.

MT: Have you ever had a ham or SWL help you out in a rescue?

Smith: Certainly. Many times, in fa The most dramatic case involvec ham. It occurred while I v stationed in the Pacific area.

A father, his son and three otl boys were diving from a private ya in the Christmas Islands. T islands are near the equator, m than 1000 miles south of Haw One day, after making three di beyond 100 feet in the same day, t four boys were struck with sev bends. The father was a ham, and contacted a ham in Honolulu, w contacted the rescue center Hawaii.

The Coast Guard dispatched a C-1 aircraft to the Christmas Islands. T plane picked up the boys and head back out for a decompressi chamber in Hawaii. Unfortunate the son died on the way. Of the otl boys, one recovered very quickly a two were hospitalized for some tir

MT: What should one of our read do if he or she should hear a distr call that is apparently unanswere

Smith: The first thing is to list carefully. Tape the transmission you can, and if you can't write do as much as you can word for wo This is extremely important. Ma sure that it is, in fact a call for he

In Hawaii, we used to go nuts wi people who named their boats "H Day," "Pay Day," or "Hey Hey because they all sounded like May

ATLANTIC AREA COAST GUARD DISTRESS AND WORKING FREQUENCIES

Freq	Purpose	Station Guarding	Mode
500 kHz	Dist & Call	Communcation Stns	CW
2182 kHz	Dist & Call	Groups, SAR Stns & COMMSTA San Juan	SSB/Voice
121.50 MHz	Aircraft Emerg	CG, commercial & civilian aircraft	AM/Voice and ELT
156.80 MHz	Dist/Safety/ Call	Groups, cutters & boats	FM/Voice and EPIRB
243.00 MHz	Mil & liferaft	Mil (& CG) aircraft	Voice & ELT
466 kHz	Working freq NTM/WX/UMIB	Guard not required	CW
472 kHz	Working freq NTM/WX/UMIB	Guard not required	CW
440 kHz	Working freq NTM/WX/UMIB	Guard not required	CW
432 kHz	Working freq NTM/WX/UMIB	Guard not required	CW
2670 kHz	Working freq NTM/WX/UMIB	Guard not required	SSB/Voice
156.65 MHz	Working freq NTM/WX/UMIB	Guard not required	FM/Voice
4134.3 kHz	Call	COMMSTAs Rcv	SSB/Voice
4428.7 kHz	Half Duplex	COMMSTAs Xmt	Night
6200 kHz	Call	COMMSTAs Rcv	SSB/Voice
6506.4 kHz	Half duplex	COMMSTAs Xmt	Day/night
8241.5 kHz	Call	COMMSTAs Rcv	SSB/Voice
8765.4 kHz	Half duplex	COMMSTAs Xmt	Day/night
12342.4 kHz	Call	COMMSTAs Rcv	SSB/Voice
13113.2 kHz	Half duplex	COMMSTAs Xmt	Day
8335.0 kHz	Call	COMMSTA Portsmouth	SITOR/NBDP
8716.0 kHz	Full duplex	Xmt	Night
8347.5 kHz	Call	COMMSTA Boston Rcv	SITOR/NBDP
8708.5 kHz	Full duplex	Xmt	Day/night
12502.5 kHz	Call	COMMSTA Portsmouth	SITOR/NBDP
13082.5 kHz	Full duplex	Xmt	Day/night
12501.0 kHz	Call	COMMSTA Boston Rcv	SITOR/NBDP
13081.0 kHz	Full duplex	Xmt	Night
16671.5 kHz	Call	COMMSTA Portsmouth	SITOR/NBDP
17208.5 kHz	Full duplex	Xmt	Day
16664.0 kHz	Call	COMMSTA Boston Rcv	SITOR/NBDP
17201.0 kHz	Full duplex	Xmt	Day
8 MHz Ch 4,5,6	Call	COMMSTA Ports/Sn Jn	CW
8465/8471 kHz	Half duplex	Portsmouth/S.J.xmt	Day/night
12 MHz Ch4,5,6	Call	COMMSTA Ports/S.J.	CW
12718.5/12700 kHz	Half duplex	Portsmouth/S.J.xmit	Day/night
16 MHz Ch4,5,6	Call	COMMSTA Ports/Sn Jn	CW
16976/16983.2 kHz	Half duplex	Portsmouth/S.J.xmit	Day

on the VHF band. If you can, find out the specific nature of the distress: is the vessel sinking, on fire, going aground, or is there an injured person on board, and if so, what kind of injury. We also need to know the number of people on board. This information makes a big difference in the kind of help that will be dispatched.

MT: Anything else?

Smith: Yes. The location is obviously very important: we can't render assistance if we can't find the vessel. So copy down the position *exactly as stated*. This is critical because people who are in an emergency situation often give several contradictory statements of their position. So, if it turns out that someone says "We're on the south side of Long Island between Long Island and Connecticut" and it turns out that you can't be in both of those locations at the same time, we want to have the exact wording so that we can check the most likely positions.

A good description of the vessel is helpful as well -- it's length, color, name, registration number, and type (power boat, sail boat, fishing boat, tanker, and so forth). You would be surprised how often we get calls about white boats of indeterminate length that are "pointed at one end and round at the other" -- that pretty well describes half the pleasure craft in the U.S.!

MT: Any other information that a listener should take note of when monitoring a distress call?

Smith: Yes, in the event a vessel is being abandoned, we would like to know if they have life rafts. A raft is much more visible in the water than a person in a life jacket.

MT: Once a listener has gathered as much information as possible, then what?

Smith: Call the Coast Guard. We are sometimes listed under emergency phone numbers in the beginning of the white pages. If that doesn't work, look in the blue pages under U.S. Government listings: Coast Guard. Call the number for a rescue center if there is one or any number that you find there except a recruiter -- they are not on duty 24 hours a day. If that doesn't work, call 911.

Most law enforcement agencies have cooperative arrangements with us. Whoever you talk to, insist that they take your name and telephone number so that we can get back to you if we need more information.

MT: What about satellites in your work?

Smith: That's a good point. If the people in distress mention that they have triggered an EPIRB (pronounced ee-purb) -- emergency position indicating radio beacon, we want to know. The EPIRB is a 2-tone oscillating pair signal, kind of like a European police siren, on 121.5 MHz, with a strong harmonic on 243.0 MHz, the military aircraft distress frequency.

If an EPIRB has been triggered, the COSPAS/SARSAT satellite system (that's a Soviet/American cooperative system) can be very helpful in pinpointing the location of the distressed vessel. On the first pass overhead, the satellite will give us a line of position on the vessel. On the second pass, it gives us an exact location.

At one time, we had a sailboat that lost its sails 600 miles north of Hawaii, and the owner was trying to motor back. He radioed that he was running low on fuel and was nearly out of food and water. He tripped his EPIRB, and we were able to fly directly to him using coordinates from the satellite and to drop food and water to him. Then we called a tug to tow him back to Honolulu.

Eventually, there will be a Global Maritime Distress and Safety System in place that will make our lives a lot easier.

MT: Does that mean that there will be no need for people to listen for distress calls?

Smith: Absolutely not. Not everyone will participate in the satellite system.

So we will always need people to guard the frequencies, and we are glad for all the help we can get. ■

by Kenneir P. Phillips, Ph.D

CFCX: Canada's First Station

In two years, CFCF radio will celebrate its seventieth anniversary -- the first such station to reach those impressive numbers anywhere in the world. From its humble beginnings as XWA to today's CFCF, it has been a long and fascinating chapter in the history of communications.

CFCF is one of just five commercial stations in Canada to have a separate shortwave outlet (CFCX) for rebroadcasting their local programs. Today on your shortwave radio you can hear CFRB in Toronto (6070 and the most widely heard), CFCN in Calgary (6030), CHNS in Halifax (6130), and flea-powered CKWX in Vancouver (6080). Tune to 6005 kHz, however, and most listeners in North America will have the opportunity to hear a bit of radio history in the making -- or more specifically, continuing. The fifth station, CFCF on 6005, is, arguably, the first radio station in the world to hold regularly scheduled broadcasts.

Numerous experimental broadcasts, both here and in Europe, laid the foundation for CFCF and many other stations quickly followed. The first broadcast on record was made by R.A. Fessenden, who was born in East Bolton, Quebec, and was a chemist with the Edison Laboratories. The broadcast originated from Brant Rock, Massachusetts on Christmas Eve, 1906. It was heard by wireless operators on ships hundreds of miles away. Others followed, including Lee de Forest's broadcast of Caruso's voice from the stage of the Metropolitan Opera in 1910 and the first transmission of the results of a Presidential election in 1916.

Where Were You Feb 16, 1931?

The 1930s brought a wealth of U.S. programs to Montrealers when CFCF became an affiliate of the National Broadcasting Company. To a broadcaster, nothing is more nostalgic than an old program log. Here's the lineup for Monday, February 16, 1931:

7:27 a.m. Time announcement
7:30 a.m. Northeastern Breakfast Entertainers
8:00 a.m. Quaker Early Birds -- Gene and Glenn (NBC)
8:15 a.m. Northeastern Breakfast Entertainers
9:00 a.m. Parnassus Trio (NBC)
9:15 a.m. Studio
9:45 a.m. Miracles of Magnolia (NBC)
10:00 a.m. Sunshine Hour
11:00 a.m. Gloom Chasers (NBC)
11:15 a.m. Studio
11:30 a.m. Organ Melodies (NBC)
12:00 p.m. Shavers Musical Bits (NBC)
12:15 p.m. On Wings of Song (NBC)
1:00 p.m. Stock Quotations
1:15 p.m. Palais d' Or Orchestra (NBC)
1:30 p.m. Hotel New Yorker Concert Ensemble (NBC)
2:00 p.m. Wilder Radio Hour
3:00 p.m. Ross Hall Feature
4:00 p.m. Canadian Electrical Supplies
5:00 p.m. Hartney's Eventide Music
5:55 p.m. Weather forecast/Program Resume/Time
6:00 p.m. Twilight Hour
6:45 p.m. Stock Quotations
7:00 p.m. Amos and Andy (NBC)
7:15 p.m. Pepper and Salt -- Xylophone and piano popular music
7:30 p.m. Phil Cook -- The Quaker Man (NBC)
7:45 p.m. Montreal Light Aeroplane Club -- Aviation Charts
8:00 p.m. Conner Washer Orchestra
8:30 p.m. Mount Royal Hotel Concert Orchestra (Remote)
9:00 p.m. Melody Mike's Music Shop (CPR Network)
10:00 p.m. Stromberg Carlson (NBC)
10:30 p.m. Willard robinson Deep river Orchestra (NBC Remote)
11:00 p.m. Hotel Paramount Orchestra (NBC Remote)
11:30 p.m. Time Announcement, Sign Off.

The question of which radio station was the first to broadcast on a regular schedule is an interesting one. As E.A. Weir points out in *The Struggle for National Broadcasting in Canada* (McClellan and Stewart; 1965): "During 1920, regular concerts began to be broadcast from The Hague. Also in 1920, in February, the Marconi Company began to broadcast from Chelmsford. KDKA, Pittsburgh, operating experimentally from 1916, made its first scheduled broadcast on November 2, 1920, when the Harding-Cox election results were announced. However, WWJ of Detroit has long claimed that on August 20, 1920, a radio program was aired by them and that the service that commenced on that day continued on a regular basis.

"There seems no doubt, however, that both stations were antedated by XWA of the Canadian Marconi Company in Montreal as a public broadcaster of regularly scheduled programs. Indeed, it would appear that CFCF is the oldest regularly operated broadcasting station in the world."

The origins of XWA are shrouded in obscurity. Company files place its inception as the fall of 1918 when test experiments were carried out from the Marconi Wireless Telegraphy Company of Canada factory building at 173 William Street. Certainly by 1919, tests had begun on a semi-regular basis. It was often difficult for those program pioneers to know if they were even being received, as the only audience consisted of a few "hams" and a handful of ships in the St. Lawrence River which were equipped with crystal receiving apparatus.

Speaking to the Parliamentary Committee of March 11, 1932, Commander C.P. Edwards, Director of Radio, Department of Marine, said, "Broadcasting in Canada started with some test programs in 1919 carried out by the Canadian Marconi Company of Montreal. Regular organized programs commenced in December, 1919, by the same company, and by 1922, broadcasting had been definitely established throughout the country."

The Marconi station was, of course, XWA, which became CFCF on November 4, 1920. These early programs of XWA/CFCF consist mainly of weather reports and t playing of Gramophone records or wind up Victrola. The first operat was J.V. Argyle, who, until his dea a decade ago, was with the Depa ment of National Defense in Ottaw One of the first musical sounds air by XWA, which was merely a box wireless equipment in the corner the factory building, was that of small Swiss music box, owned now then, by D.P. Coates of Calgary.

On May 20, 1920, a special progra with an orchestra and solo Dorothy Lutton was broadcast XWA in conjunction with the annu meeting of the Royal Society Canada at the Chateau Laurier Ottawa. Reception was good Ottawa, more than a hundred mil away, and both the Ottawa Citiz and the Montreal Star carri feature stories the next day -- one the first times that the newspape had even acknowledged this bra new "toy." Among those who hea the broadcast at the Chateau we Sir Robert Borden, the Duke Devonshire, William Ly MacKenzie King, and Sir Hen Drayton.

The impact of this activity w immediate and mounting. Peop were lining up at the counters electrical shops to buy hon receivers or "crystal sets" as th became known. Department stor established radio departmen CFCF programs were wired in local theatres for broadcast duri intermission. Often, the broadcas received larger billing than t picture! All over the countr amateurs were assembling sets f friends or relatives, or going in business by starting radio shops. T assembling of crystal sets became national preoccupation.

Complete sets were promised for sa in the near future and the publ awaited not-so-patiently. Newspap coverage increased, with columns radio news and comment maki their first appearance. Plans for ne stations were widely publicize including CKAC, Montreal, whi began regular programming in 192 completely equipped with Canadi Marconi apparatus. Early photos the studio confirm the legend th the need to overcome microphon jitters sometimes reached bizar

proportions. The two CKAC microphones resembled huge floor lamps, complete with shades!

The word "radio" was still unused. Broadcasting was called "wireless telephony." One of the first companies to realize the importance of broadcasting advertising was the Berliner Gramaphone Company of Canada, forerunner of the Victor Company of Canada. They were advertising in April of 1920, "His Master's Voice Records by Wireless Telephone, by arrangement with the Marconi Wireless Telegraphy company of Canada, a His Master's Voice Victrola Concert, featuring the latest and most popular selections, will be given tonight and every Thursday from 8 to 9 p.m. for the benefit of wireless students. Captains and officers of ships in port are invited to enjoy this entertainment aboard their vessels. Operators tune to 1200 meters."

By 1922, broadcasting was well on its way in the United States and Canada. In that year, thirty-nine commercial stations were licensed by the Department of Marine in Ottawa. Half of them never started, or, if they did, closed by the end of the year. Of more than ninety-one licenses issued up to 1926, only forty stations were operating. The mushrooming of stations was even greater in the U.S.. By the end of 1924, there were 530 broadcasters on the air -- over 1100 had been licensed but the toll had been great.

All stations shared common problems, the fight to maintain a dominant place in the community, the multiplying difficulties of programming, the demands of composers for payment and the utter inadequacy of their financial backing.

In 1922, CFCF equipped and moved into its first real broadcast studio located in the Canada Cement Building in Phillips Square. An early photograph shows the ever-present drapes and a slightly larger pile of equipment in the corner. Microphones were now on stands. The two most important pieces of equipment in the studio were a piano and a Gramophone. The piano was used for live performances, the Gramophone for recorded.

Remote broadcasting had already begun. Regular performers heard from the Phillips Square location were the dance bands of Joseph Smith from the Mount Royal, Andy Tipaldi from the Ritz-Carlton, ands Harold Leonard from the Windsor. Even the 1923 yacht race from Lake St. Louis was described, using a portable, hand-cranked transmitter. Artists broadcast under the names of their sponsors -- Cliquot Club Eskimos, A & P Gypsies, Ipana Troubadours, Goodrich Silvertown Orchestra, and the Lucky Strike Orchestra. Billy Jones and Ernie Hare, the Happiness Boys, were known at various times as the Taystee Breadwinners, the Interwoven Pair, and the Best Food Boys!

CFCF and broadcasting in Canada came of age in 1927. Large, fully-equipped studios were completed in the Mount Royal Hotel. The new transmitter was set up in the penthouse. The main studio was completely covered with drapes, as was the practice to deaden the sound. More complex equipment was installed just in time for Canada's greatest broadcast venture of the decade -- the Confederation Diamond Jubilee celebrations in Ottawa. A coast-to-coast network was improvised, with 23 stations involved. CFCF was the key Eastern anchor, bringing to Montreal -- as did stations in each of their areas -- the sound of the Peace Tower Bells for the first time in history. CFCX shortwave, then called VE9DR, carried the signal to the world.

1928 brought to Canada the first Trans-Atlantic broadcast, the Thanksgiving Service from Westminster Abbey. The Marconi receiving station in Yamachiche, Quebec, picked up the BBC program and fed it to the CNR network, the fore-runner of the CBC. This was followed on November 11 with a live transmission of the Armistice Service in Whitehall. What is now so commonplace was tremendously exciting. For the first time, the distances that separate the world's cities began to shrink. Even the first live satellite television transmissions from Europe pale in comparison with the enthusiasm that these Trans-Atlantic radio broadcasts generated. One elderly lady in Saskatchewan wrote that "it was a shame to get our dear King up at such an hour..." The broadcast, of course, was heard in that province at 4:00 a.m.

E.A. Weir, in his *Struggle for National Broadcasting in Canada* says, "here a belated but long-deserved tribute must be paid to the unselfish cooperation of the Canadian Marconi Company. This company repeatedly placed its beam stations, Yamachiche (Receiving) and Drummonville (Sending), at the disposal of the national service for many Trans Atlantic broadcasts between 1929 and 1932 without any monetary remuneration whatsoever and, indeed, with but a modicum of recompense in the way of publicity. No one in this country knows better than I how wholeheartedly Canadian Marconi cooperated in those numerous inter-empire and international broadcasts."

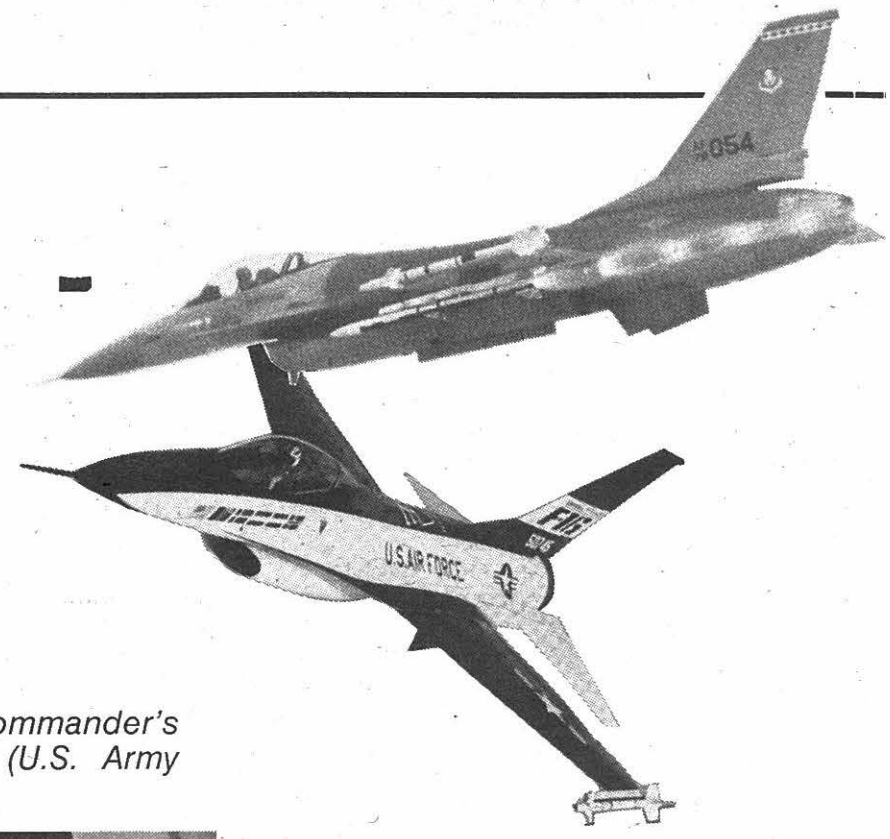
Those were exciting years indeed. Virtually the entire broadcast day was music, either local or network. As you may notice, there was a complete absence of schedule newscasts. Instead, listeners were treated to nightly "Miracles of Magnolia" and "Amos 'n Andy" broadcasts from the States. And with this cream of U.S. talent available to Canadians, there grew an increased interest in local programming.

Every night, CFCF joined with stations in the Maritimes, CNRO in Ottawa, CFRB -- another station with a shortwave outlet still on the air today -- CKOC in Hamilton and CFPL in London to form the first regular Canadian Broadcast network. It was a cooperative venture with Canadians hearing the best of their talent as well. Big companies -- Imperial Tobacco, Canada Starch, General Motors, Imperial Oil and Dominion Linoleum all began regular sponsorship.

But that was not to last. We close this chapter in the history of broadcasting with radio heading into the Depression. Radio itself survived the Depression, and the reason was that it was not only free, but it provided others, carrying the burdens of the financial downturn, with relief, however momentary, from their weight. Every major record company, however, manufacturers of radio equipment, movie industry giants, all either went into receivership or tottered near the brink of bankruptcy. In the midst of this bleak period, radio enjoyed its greatest years, broadcasting to millions of people who had bought their sets before the Depression and now could afford no other entertainment. Radio survived the Depression as it will survive other challenges. Because radio will always be free.

Special thanks to Richard Lemke for his massive assistance with this article. -- K.P. Phillips ■

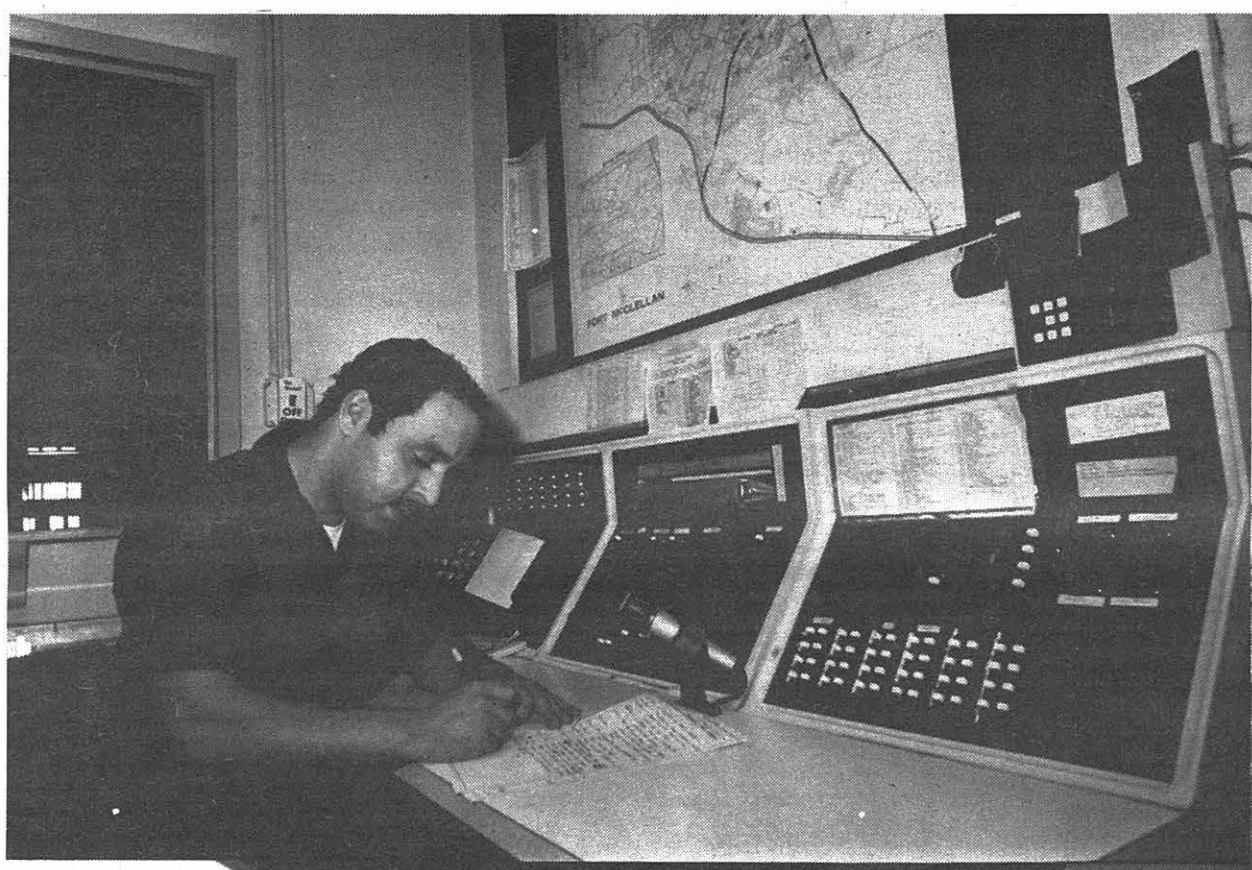
Nellis Air Crash -



by Todd Shideler

Monitoring the Aftermath

Disaster communications are coordinated through the base commander's console such as this installation at Ft. McClellan, Alabama (U.S. Army photograph)



Military Assistance Safety and Traffic (MAST) is often involved in rescue missions, such as this one in which a helicopter airlifts an injured climber at the foot of Arizona's Dragoon Mountains (Army News Features)

Chopper pilot rushes supplies to fire scene near Ft. Huachuca, Arizona (Photos by Tom Rippee)

The phone started ringing just after noon. Nellis Air Force Base had just announced that two F-16A jets had crashed about 70 miles north of Las Vegas; however, at that time they had no other information to give to the press.

The phone calls, one from a local TV reporter and the other from a reporter from Las Vegas's largest newspaper, were in search of information. It was time for my scanners, a Regency MX5000 and a Radio Shack PRO-31 handheld, to go to work.

From the information I had so far I thought it might be on BLM (Bureau of Land Management) land so I started listening there and it instantly paid off! A large brush fire was burning and was emitting a toxic smoke so fire fighters could not get close enough to fight it. All they could do was stand by and watch.

I relayed this interest to the media who were then able to find out that the fire was caused by the planes that had crashed.

Next I turned to the Nellis E.O.D. (emergency ordnance disposal) frequencies; these would come alive later in the day as the E.O.D. team was *still* enroute from Nellis to the crash site.

Knowing that the Indian Springs base handled all of the search and rescue operations for the bombing range I tried their ground frequency. The helicopters would check in there whenever they took off or landed.

Finally, I tried the Nellis search and rescue channel which was in the UHF air band (see accompanying frequency chart). I didn't think much would be on that frequency because the planes had been found almost 1-1/2 hours ago; boy, was I wrong! It proved to be a gold mine of information.

For several hours following the crash they were unable to establish direct communications with Nellis range command ("Blackjack") or with the base itself. The solution was to set up a relay.

A plane continuously circled the crash site, passing information between there and the base. The system worked well most of the time -- not only for them but for me as well!

When the E.O.D. team arrived on the scene they used radios in the VHF low military band. Most of their information dealt with what explosives they had on board the planes and what they found.

Surprisingly, no communications took place on the Nellis or Indian Springs fire/crash frequencies, nor was information heard on the base commander's frequencies.

The message was passed to the on-site commander to have "Redstone" come up on "4.277 HOTEL FOXTROT" when they arrived. The only problem was no one knew who Redstone was! The control station finally had to come right out and say that it was the communications personnel! Unfortunately, I was not able to monitor anything on that frequency because I have no HF equipment.

The aircraft notified Nellis the exact coordinates of the crash, information not yet revealed to the news media who wanted to know where the crash took place. The condition of the two pilots had no yet been released because Nellis did not know. The base was advised to "prepare for mortuary affairs" and soon after came the message "we have two deltas confirmed." Nellis released this information to the press about an hour later.

All through the afternoon I was able to keep track of the status of the brush fires in the area (which, by now, had broken into four) preventing Air Force personnel from doing a thorough check of the area due to excessive heat and threat of explosions from ammunition.

Postscript

I realized after this event how important it is to keep good lists of the frequencies used in your area; a frequency may never have been heard before but one incident may activate it. One scanner may be adequate for police and fire calls but, as one TV station found, complete frequency coverage is important as you never know what you may want to monitor. ■

Crash Frequencies (MHz)

Primary Search and Rescue (used as the relay)	282.800
E.O.D. & Indian Springs Helicopters (net 12)	410.350
same as above	36.390
same as above	36.330
Indian Springs Ground Party & Helicopters	148.225
HF Frequency to Nellis AFB (from crash site)	4.277

Tactical Call Signs

BLACKJACK	Bombing Range Control
BORE 61	Relay aircraft over crash site
DELTA	Deceased person
E.O.D. ONE BRAVO	E.O.D. team at crash site
E.O.D. OPS	E.O.D. Base at Nellis
REDSTONE	Communications team
STARDUST	Crash site and Nellis commanders
STING	Indian Springs helicopters
SUNRAY	Indian Springs Helicopter control
VIPER	F-16 flying over crash site (relieved by BORE 61)

Notes:

BORE is not a normal Nellis callsign for aircraft.

STARDUST is a new call sign, the old one was VEGAS but this has not been heard in a while.

STING & SUNRAY also operate in the Nevada Test Site as well as at Nellis and Indian Springs.

RADIO ROUNDUP: Broadcasting

Larry Mille

3 Lisa Dri
Thorndale, PA 913

It was pretty exciting, for a short time. **Back a few weeks ago, smack dab between issues of Monitoring Times, America had an offshore pirate station.**

This isn't the first time for someone to park a boat offshore and broadcast to the U.S.. Old timers might remember the Reverend Carl McIntyre, who, upon losing the license to his Media, Pennsylvania AM station to the F.C.C., promptly packed his bags and headed offshore.

McIntyre's religious/political boat station didn't do all that well and went under, so to speak, a short time after it came on the air. That was back in the 1970s.

The 1980s have had no real shortage of pirate activity, up until the recent F.C.C. crackdown. One of those people who was cracked down upon was Alan Weiner.

You don't have to be too much of an old timer to remember his most recent antics. Weiner apparently had a legitimate radio station in Maine. And he had a studio-to-transnmitter relay licensed as well. Well, Weiner, who reportedly had already been shut down by the F.C.C. on a previous occasion for pirate broadcasting, put this relay on the air as an actual broadcast station in Yonkers, New York. The Commission did not approve, the station was closed, and Weiner vowed to return.

Then one night a few weeks ago, came another pirate voice from the "Good Ship Sara," anchored off Long Island. The voice identified itself as --- Weiner. This time the station was called Radio New York International and it was well equipped to do the job. Based on a Honduran-registered boat anchored off Long Island, it broadcast on -- no kidding -- AM (1620), shortwave (6240), FM (103.1) and even long wave (109).

Both the AM and shortwave frequencies were audible over a wide area, with reception reports being called in from as far away as the midwest.

Weiner, speaking over Radio New York International, said he went on the air "because radio was so bad" in New York. One station representative also mentioned that they were "big fans" of off-color New York/Philadelphia DJ, Howard Stern, who promptly had them on his program two days later.

It was said that Radio New York International was financed by a group of European pirates. Programming, while it lasted, was less than impressive, a ho-hum playlist of old rock music and rather amateurish DJs. During its short lifetime, RNI said it was "testing" for its real sign on on August 1. That sign on never came. It, too, was closed down by the ever-vigilant F.C.C..

It *was* exciting. Signal strength was good. But little else about this was, except for the fact that QSL card collectors lucky enough to hear it were promised another card for their collection. Can Weiner be kept down? Probably not. It appears this man has a mission from God. Ironically, for three nights after the station left the air, another pirate took RNI's 1620 spot on the AM dial, playing early 70s rock. The new pirate never ID'd. But its message was clearly one of defiance. Pirate radio will never die.

Still, things are better here than in the UK when it comes to pirates. There, reports *MT* reader Paul D. Youngs of Scotland, government radio investigators are being terrorized when they a' lookin' for pirates. According to an article in the *The Times*, a group of London-based anarchist groups have "latched on" to the cause of the pirates, telling them how to "disable" policemen, ambush investigators, and beaten.

Less frightening is the story by first-time *MT* contributor David Klopfenstein, who this month narrates the story of another pirate, this one based on the west coast. It's a story of teenagers dissatisfied with local radio and who had a ball -- not to mention the fame and admiration bestowed on them by their schoolmates -- competing with the "big boys." I hope you enjoy the article.

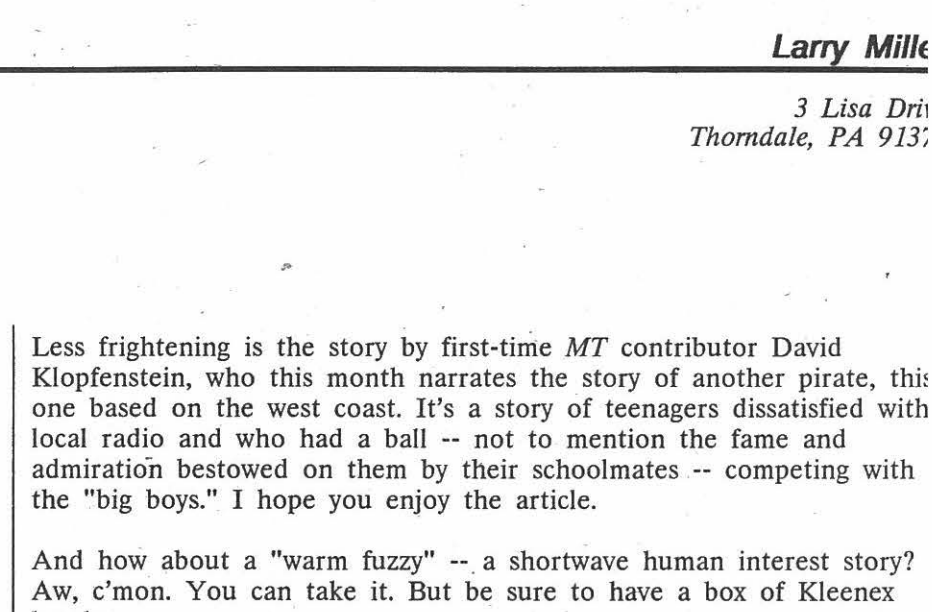
And how about a "warm fuzzy" -- a shortwave human interest story? Aw, c'mon. You can take it. But be sure to have a box of Kleenex handy.

According to Ken MacHarg, HCJB's "Saludos Amigos" program was responsible for the marriage of an Idaho man and a woman from Capetown, South Africa.

Melanie Hawes had written to Saludos Amigos, asking MacHarg to broadcast her name in an appeal for pen pals. Over a dozen people responded, one of whom was Jeff Berg, in Firth, Idaho. The exchange of letters continued and the relationship grew until finally, Ms. Hawes visited Berg in May.

"When she walked off the plane," said Berg, "she was just the same as she appeared in her letters." By the time you read this, the happy couple will be formally united in Holy Matrimony.

Just think, on the very same medium that callously shouts figures of battlefield deaths in Iran and Iraq, that fills our ears with political propaganda, two lonely people found love. Isn't that special? I think I'm going to gag.



Ed Provencher of Biddeford, Maine, sends in a copy of his prized QSL card from the Red Cross Broadcasting Service. He heard that on 9870 kHz at 0315 UTC.

Came across the sharp way of keeping track of what you've heard on the shortwave bands. Mark Swarbrick takes a very small date stamp -- the sort of thing you can pick up real cheap in any office supply store -- and stamps the date he heard a station, right above the time and frequency he heard it, in his *Radio Database International*. It's an amazingly neat, easy and accurate way of keeping track of what you've heard. Finally, I can get rid of my index cards.

Speaking of Radio Database, there are a number of new RDI White Papers out. These are in-depth receiver reviews and

they're available from many shortwave stores. *RDI* White papers are where you should go before you buy a radio.

Before I lose my composure again over Jeff and Melanie, let's take a look at some station news. Sniff.

There have been continuing problems for the Finnish at their new transmitter site in Pori. The problems are technical, but because the relay is unmanned, the breaks, when they occur, often last for hours, even days. Radio Finland apologizes for the situation. Incidentally, Finland says that their toll-free number has been a smashing success.

Radio Australia says it may soon be allowed to send a reporter to Jakarta for the first time since 1980. The Indonesian government had banned RA from stationing a reporter their because of what it saw as an anti-Indonesian bias.

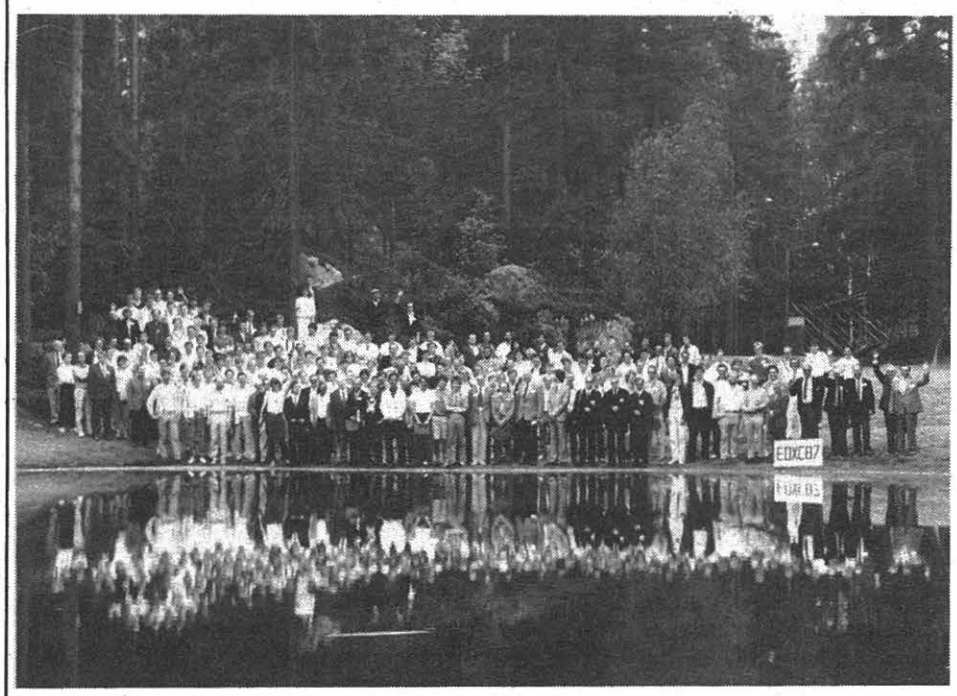
Warwick Beutler, who had been RA's reporter on the island nation since 1977, refused to extend his stay permit. Warwick then left for Singapore, which refused to allow him to stay there. No word on where Warwick is today.

Incidentally, next time you're "down under," **be sure to tune in the Australian Broadcasting Corporation's metropolitan and regional stations.** They're now rebroadcasting Radio Australia's international shortwave service.

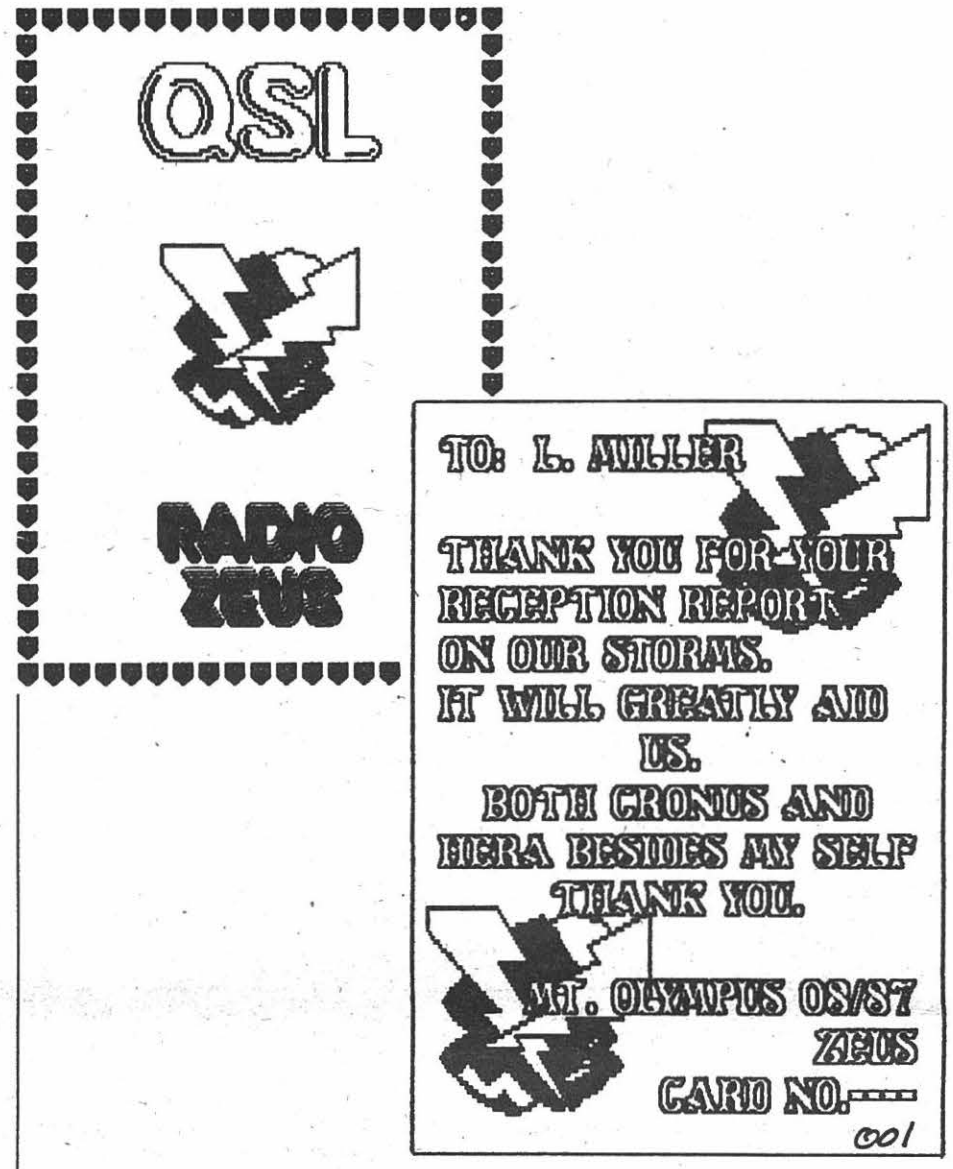
The results are in. **Spanish Foreign Radio took a survey of its listeners and found that SFR came in number two behind Radio Netherlands.** In third, fourth and fifth places, respectively, were BBC, Deutsche Welle, and Radio Sweden.

XEW, La Voz de la America Latina (The Voice of Latin America) has been heard on 6165, 9515, and 15160 kHz. It's been among the missing for several months.

Try 7355, 9740, 11625, or 12085 for the anti-government **Voice of Iraq.** It's a longshot, but occasionally audible.



Attendees at this year's EDXC convention (European DX Council) are pictured above meeting in Helsinki, Finland. Photo courtesy of George Wood, Radio Sweden International.



Who says thunderstorms don't QSL? Larry Miller received this card from an anonymous reader in Delaware. Now that's a one-of-a-kind QSL!

Rumor has it that the Japanese will be building a relay station for Radio Tanzania next year. That'll be located in Dodoma, which is Tanzania's yet-to-be-completed future capital city.

The Soviets have ended all transmissions to China from their Radio Station Peace and Progress. This represents a reduction in broadcast time from 138 hours to 40 hours a week.

A new Ethiopian opposition radio station has begun broadcasting on 7200 and 9660 kHz. It calls itself the Radio Voice of Ethiopian Unity and is on the air for one hour a day. The BBC Monitoring Service, which uncovered the station, says it is heard at about 1900 UTC.

All India Radio is in the process of installing new transmitters -- six 250 kilowatt units. And these are for the external service, which the Indian government feels, is inadequate in many parts of the world. Here! Here!

Thanks to everyone who sent in clippings this month, including Art Blair of San Francisco. I raise my bottle of Frisco's finest, Anchor Steam beer, to Art, and the fine folk who submitted the following loggings...

RADIO ROUNDUP: Broadcast Loggings

0000 UTC on 11855 kHz
Brazil: Radio Aparecida in Portuguese. Brazilian ballad program. Heavy interference from Asian on 11855. (Fred Carlisle, Tumwater, WA)

0009 UTC on 7470 kHz
Clandestine: Radio Caiman in Spanish. Clear "Radio Caiman" ID and talk about Cuban involvement in Angola. (Carl Volz, Valparaiso, IN)

0014 UTC on 15140 kHz
Chile: Radio Sistema Nacional, Santiago in Spanish. IDs as "Santiago." Correspondents with reports on Catholic church's role in Columbia and Nicaragua. Fair signal. (Carl Volz, Valparaiso, IN)

0015 UTC on 15190 kHz
Brazil: Radio Inconfidencia in Portuguese. Two announcers conduct sports interview followed by live-soccer coverage.

0015 UTC on 9630 kHz
Spain: Spanish Foreign Radio in English. Feature on recent archeological find in Tampa, Florida. Spanish guitar ballads and commentary on relations with Australia. (Wayne Bekins, San Antonio, TX)

0036 UTC on 4864 kHz
Bolivia: Radio Emisora 16 de Marzo in Spanish. Two clear IDs at 0038 and 0101 UTC. Very good signal but notuseable the next night. (John Tuchscherer, Neenah, WI) John is one of the "experts" in the "Shortwave Listening with the Experts," book. Welcome, John. --ed.

0050 UTC on 11926 kHz
Brazil: Radio Bandeirantes in Portuguese. Announcer with station ID followed by Brazilian pop music. (Fred Carlisle, Tumwater, WA)

0115 UTC on 5040 kHz
Ecuador: La Voz del Upano in Spanish. Singing station IDs plus Andean folk music. Slight fading. (Mark Gibson, Memphis, TN)

0125 UTC on 4985 kHz
Brazil: Radio Brazil Central in Portuguese. Usual rapid-fire sports commentary. Clear signal with only occasional fading.

0130 UTC on 17815 kHz
Brazil: Radio Cultura Sao Paulo in Portuguese. Fading signal and very weak. Audible ID at 0130 and into Brazilian pop music.

0135 UTC on 4805 kHz
Brazil: Radio Dif. do Amazonas in Portuguese. Excited soccer coverage with long "goooooooal!" after each point scored. Brief break for ID.

0145 UTC on 4845 kHz
Brazil: Radio Nacional, Manaus in Portuguese. Live soccer coverage (sounded like the same game and announcers as Radio Dif. do Amazonas (see 0135 UTC logging). Occasional ad break and Nacional ID at 0201 followed by more soccer.

0205 UTC on 4885 kHz
Brazil: Radio Clube do Para in Portuguese. Interview, ID and sports coverage -- but not soccer!

0220 UTC on 11745 kHz
Brazil: Radio Nacional do Brasil in English. Popular Brazilian rock stars sing plus feature on "Contemporary Brasil."

0230 UTC on 5095 kHz
Columbia: Radio Sutatenza in Spanish. Slight fade as ID was given by announcer. Local music between Latin vocals.

0255 UTC on 15150 kHz
New Zealand: Radio New Zealand International in English. Time check as "it's one and a half minutes till three." Short classical music interlude and time check at 0300 UTC. ID as "Wellington" followed by comedy routines for a half hour. Another ID at 0330 and music from Englebert Humperdink. (Carl Volz, Valparaiso, IN)

0320 UTC on 8515 kHz
Peru: Radio Amistad in Spanish. Romantic Spanish ballads and Peruvian folk music. Heard clear "Amistad" at 0406 UTC. Heavy utility interference, as usual. Logging tentative. (Fred Carlisle, Tumwater, WA)

0324 UTC on 6150 kHz
Costa Rica: Radio Impacto in Spanish. Talk about Cuba and mention of Batista and the history of the revolution. ID given as "Impacto." (Carl Volz, Valparaiso, IN)

0345 UTC on 6282 kHz
Peru: Radio Huancabamba in Spanish. Fast-talking male with ID and station location at 0400 UTC. Peruvian "campesino" music. Recheck found station on until a 0504 UTC sign off (local Peruvian midnight). Some utility and heterodyne interference. (Fred Carlisle, Tumwater, WA)

0349 UTC on 5930 kHz
Czechoslovakia: Radio Prague in English. Two lady announcers discussing how to cook pancakes. Announcer joked that the dough was heavy enough to sink a ship. Really a silly show! (Carl Volz, Valparaiso, IN)

0405 UTC on 4850 kHz
Cameroon: Radio Nacional in French. Fast-talking announcer with African pop music. No ID heard and station listed as tentative. (Fred Carlisle, Tumwater, WA

0410 UTC on 3220 kHz
Ecuador: HCJB. Wait. This isn't just another HCJB logging. This is HCJB's 10 kw domestic service in Spanish. Very easy to hear. (Carl Volz, Valparaiso, IN)

0442 UTC on 6115 kHz
Mexico: Radio Universidad in Spanish. ID at 0503 and Latin pop music. Severa mentions of Hermosillo. Interference from Radio Union, Peru. (Fred Carlisle Tumwater, WA)

0510 UTC on 4830 kHz
Gabon: Africa No. 1 in French. ID from announcer as "Music on Africa No. 1" a 0517. African pop music followed. (Fred Carlisle, Tumwater, WA)

0520 UTC on 4904 kHz
Chad: Radio Dif. Nationale, Ndjamena in French. DJ chatter with program of French African hi-life music. Signal buried by a strong jammer at 0540 UTC. Never heard a positive ID. Submitted as tentative. (Carl Volz, Valparaiso, IN)

0520 UTC on 11825 kHz
Tahiti: Radio Tahiti in French and Polynesian. Nice mix of music island and curren music; great programming. (Carl Volz, Valparaiso, IN)

0540 UTC on 7245 kHz
Angola: Radio Nacional, Luanda. Announcer in local African language with "Radio Nacional" ID followed by presumed news program at 0600 UTC. A poor signal with distorted audio. (Fred Carlisle, Tumwater, WA)

0545 UTC on 4000 kHz
Cameroon: Radio Bafoussam, in French. Extremely weak and fading signal Religious music sung in French. No ID observed but definite African accent by announcer. Submitted as tentative. (Carl Volz, Valparaiso, IN)

0545 UTC on 4945 kHz
Columbia: Caracol Neiva in Spanish. Announcers interviewing a guest in the studio Station promo and "Caracol" ID at 0600 UTC with Latin American newscas following. (Carl Volz, Valparaiso, IN)

0545 UTC on 3340 kHz
Tanzania: Radio Tanzania-Zanzibar in Swahili. Talk from announcer was definitely Swahili but interference prohibited me from picking up any full sentences. Weak signal with pop music and voice breaks. No IDs heard. Reception on this night was good. (Carl Volz, Valparaiso, IN) Another tentative I'd bet on. --ed.

0552 UTC on 4770 kHz
Nigeria: Radio Nigeria, Kaduna in a local language. ID as "Radio Nigeria" at 0600 after going into English for a newscast. (Fred Carlisle, Tumwater, WA)

0658 UTC on 7215 kHz
Ivory Coast: RTV Iviorienne, Abidjan in French. Radio Drama followed by ID and time check at 0700 UTC then into newscast. Top story was the Iran scandal. (also knowr as "Gippergate.") (Carl Volz, Valparaiso, IN)

0715 UTC on 9655 kHz
Australia: Radio Australia in English. DX program call "Radio Waves from the South Pacific." Gave report on Radio Cook Islands and Radio Tahiti. (Carl Volz, Valparaiso, IN)

0750 UTC on 11705 kHz
Japan: Radio Japan in English. Weak signal. Commentary on the economy of Japan and how they will survive the oil crisis. (Carl Volz, Valparaiso, IN)

0950 UTC on 4945 kHz
Brazil: Radio Nacional Porto Velho, in Portuguese. Easy-listening Portuguese music and several Nacional IDs at 1000 UTC. News briefs and local announcements. (Kevin Burdette, Arlington, TX)

1015 UTC on 6175 kHz
Costa Rica: Faro del Caribe in Spanish. Male announcer with station ID and location at 1015 UTC. Latin pop music and interference from WYFR. Station's signal was temporarily in the clear with a 1045 UTC sign off. (Fred Carlisle, Tumwater, WA)

1045 UTC on 4864 kHz
Columbia: La Voz de Cinaruco in Spanish. Male announcer with ID and Latin pop music. (Fred Carlisle, Tumwater, WA)

1155 UTC on 9535 kHz
China: Radio Beijing in English. Just caught the sign-off announcement, but heard closing for the North America Service and frequency schedule. Announcer gave his name, ID and "thanks for listening." (Carl Volz, Valparaiso, IN)

1158 UTC on 15575 kHz
South Korea: Radio Korea in English. Listener's questions, like, "How many sports at the 1988 Olympics?" (Carl Volz, Valparaiso, IN) Including gas bomb tossing? -- ed.

1215 UTC on 9715 kHz
North Korea: Radio Pyongyang in English. Korean folk music, the usual feature on reunification of North and South and -- are you ready for this -- rock music. (Kevin Burdette, Arlington, TX)

Send your loggings to Gayle Van Horn, 160 Lester Drive, Orange Park, Florida 32073 USA. All loggings are of English broadcasts unless otherwise noted.

1245 UTC on 9940 kHz
Clandestine: La Voz de CID in Spanish. Spanish guitar ballads from male singer. Slight fading during "La Voz de CID" ID. Discussion about Cuba with continuing Latin style music.

1245 UTC on 11937 UTC
Kampuchea: Voice of the People of Kampuchea in Lao/Viet dialect. March music follwed by English ID at 1300 UTC. Many mentions of Kampuchea. Asian music and sign off at 1318 UTC. Reception down after 1300 UTC but still audible. (Fred Carlisle, Tumwater, WA)

1245 UTC on 3395 kHz
Papua New Guinea: Radio Eastern Highlands in Pidgin. Male announcer with native island drum music and English pop. Papua New Guinea mentioned but no definite ID heard. (Fred Carlisle, Tumwater, WA)

1250 UTC on 2325 kHz
Australia: ABC, Tennant Creek. Good reception with strong signal. Featuring pop music and news at 1300 UTC. Usual ID at 1230 followed by "cry in your beer" music from Bill Anderson. Parallel 2310 not heard so well. (Fred Carlisle, Tumwater, WA)

1250 UTC on 3375 kHz
Papua New Guinea: Radio Western Highlands in Pidgin and English. Heard mentions of Papua New Guinea at 1301 but no ID. Male preacher with English religious sermon. Station abruptly off at 1325 UTC but no formal sign off. (Fred Carlisle, Tumwater, WA)

1325 UTC on 4450 kHz
Afghanistan: Radio Kabul via the Dushanbe, USSR relay. Program of Arabic and Asian music in presumed Kabul. Afghanistan mentioned by female announcer at 1333 UTC. Signal degrading somewhat by 1350 UTC with occasional fading. Some utility QRM also. (Fred Carlisle, Tumwater, WA) -- Based on these details, let's call this a tentative logging. -- ed.

1325 UTC on ???
Philippines: Maharlika Broadcasting System - Radio NG Bayan in English and unknown Asian dialect. Male announcer with sports reports and station ID as "This is your all sports radio network, up to date '78!" Announcer also ID'd on the hour as "Radio Bayan" (heard no mention of NG). U.S. pop music and world news at 1400 UTC by female announcer. (Fred Carlisle, Tumwater, WA) Great catch, Fred! -- ed. [Agreed. A fantastic catch. But it would be even better if we had a frequency here, folks. --Miller]

1325 UTC on 9775 kHz
Bangladesh: Radio Bangladesh in presumed Nepalese. Fair reception of great sub-continental music. "Radio Bangladesh" ID at 1345 with a sign-off by female announcer. Radio Bangladesh back on for unscheduled broadcast at 1400-1500 UTC with same programming. (Fred Carlisle, Tumwater, WA) Extended broadcast because of religious holiday, Ramadan. -- ed.

1345 UTC on 3275 kHz
Papua New Guinea: Radio Southern Highlands in Pidgin. U.S. pop music and no ID but two mentions of Papua New Guinea at 1400 UTC. National anthem and sign off at 1402 UTC. (Fred Carlisle, Tumwater, WA)

1423 UTC on 9820 kHz
Guam: KTWR (Trans World Radio) in Tamil. Talk from announcer with ID and sign-off in English with frequency and station announcement at 1440 UTC. (Fred Carlisle, Tumwater, WA)

1519 UTC on 11900 kHz
Northern Marianas Islands: KYOI in English. Suprised to hear KYOI still on the air with plenty of IDs and rock/pop music by the Eagles, ELO, and Billy Joel. (James Kline, Santa Monica, CA)

1525 UTC on 11940 kHz
Iran: Voice of the Islamic Republic of Iran in Arabic. Talk by two announcers with Arabic music. English ID at 1601 UTC. Some interference. (Fred Carlisle, Tumwater, WA)

1605 UTC on 11615 kHz
Pakistan: Radio Pakistan in English. World news report and ID followed by local news. Sign off at 1630 UTC. 9465 kHz frequency not heard. (Fred Carlisle, Tumwater, WA)

1730 UTC on 15505 kHz
Kuwait: Radio Kuwait in Arabic. Presumed newscast amd Arabic music. "Hua al Kuwait" ID at 1801 UTC. Fred Carlisle, Tumwater, WA)

1745 UTC on 15145 kHz
East Germany: Radio Berlin International in English. This is reported to be their Africa Service, but is heard clearly on the west coast of North America. Program of music and listener's letters. Good signal. (James Kline, Santa Monica, CA)

1850 UTC on 21685 kHz
Netherlands: Radio Netherland in English. Interviews and discussion on the increasing problems of the aging in Kenya and the Christian organizations that assist them. Parallel 17605 kHz.

1856 UTC on 15045 kHz
Dominican Republic: Radio Discovery in English and Spanish. IDs in both languages with several station promotions. Spanish pop music and more IDs. Very good signal strength in Florida.

2040 UTC on 11920 kHz
Morocco: RTM Morocco in Arabic. Uninterupted Arabic music for over 30 minutes. One brief break at 2100 UTC with a possible ID and into more Arabic music. Submitted as tentative. (Y. Lee Kyotee, Yuma, AZ)

2112 UTC on 9675 kHz
Belgium: BRT in English. Talk of how Ramadan is celebrated in Belgium, followed by discussion on the South African Council of Churches. (Carl Volz, Valparaiso, IN)

2115 UTC on 7245 kHz
Libya: Radio Jamahiriya in English. Signal barely audible as two announcers spoke ot the "computerized, institutionalized system in the U.S. that causes psychological terror." Huh? Anyone know what they're talking about? (Carl Volz, Valparaiso, IN) I'd like to discuss it with you but I'm putting my MT column into the computer and worrying about making the deadline. --ed.

2200 UTC on 15365 kHz
Canary Islands: Radio Nacional de Espana in Spanish. ID as "Radio Nacional Espana en Canarias." News briefs and announcements followed by excerpts from a speech. Ocassional Spanish instrumental music. -- I'm really curious about this. There's no external service from the Canary Islands although there is a Spanish Foreign Radio relay there. The ID you heard, however, was for the mediumwave-AM Canary Islands national service. Could bear watching. -- ed.

2235 UTC on 4870 kHz
Benin: La Vox de la Revolution in French. French and native African music on drums and flutes. Chit-chat between two male announcers and a drum roll introducing each new portion of the program. Closing ID and station announcements with national anthem. Sign-off at 2300 UTC. (John Bonet, Lafayette, LA)

2320 UTC on 4783 kHz
Mali: RTV Malienne in French. French and African music and many local station features. ID with frequency, closing announcements and martial national anthem. Sign off at 0000 UTC. (Wayne Bekins, San Antonio, TX)

Bob Grove, WA4PYC

P.O. Box 9
Brasstown, NC 2890

Sensors are being used to bug illegal aliens. Recent newspaper reports of illegal aliens crossing into the United States from Mexico have prompted inquiries of the Immigration and Naturalization Service (Border Patrol) of the Department of Justice. How are they attempting to control the influx?

Magnetic, seismic and infrared sensors are planted to detect vehicular and pedestrian movements at 180 strategic points across the U.S.-Mexican border, connected to an electronic center at Chula Vista, California, where dispatchers can alert agents by radio.

Additionally, some 450 agents are assigned to crossover points near San Diego. With night-vision scopes and radios, they assemble via van, truck, car, horseback, and on foot to catch the wave of unauthorized emigrants from Mexico. *(From H.E.Miller, Seattle, WA)*

Meanwhile, customs also beefs up its electronic surveillance. The United States Customs Service has awarded a $25 million contract to Eaton Corporation of Westlake Village, California, to develop a sophisticated command, control, communications, and intelligence system for drug interdiction along the southern border.

Eaton is expected to have initial phases of the elaborate system operational within the year, utilizing air and vessel traffic control with radar displays and signal processing. *(Item sent in by David Branscombe, Newark, OH)*

Word reached us at press time that **Regency Electronics has closed their Satellite Beach, Florida, land mobile division,** apparently as an economy move. Operations are scheduled to be recombined under one roof at Regency's Indianapolis headquarters.

The Satellite Beach facility was to have been the focus for manufacturing of several new scanners including the delayed Turboscan, the future of which now rests in Indianapolis.

An unexpected, but serious radio threat may be posed by skip. On June 17th, 1987, a Delaware state trooper collided on I-95 with a car carrying two purse snatching suspects and a child. The trooper was seriously injured; all three in the other car were killed.

The local chief of police erroneously pursued a different set of suspects because his radio was being jammed--not by malicious interference, but by legitimate users being heard by skip from hundreds or even thousands of miles away.

Communications on the local channel was tied up for nearly six hours because of a combination of accident traffic and skip interference. Had another disaster or serious accident occurred during that period, police communications would have been useless.

Skip is a well-documented phenomenon on low band (30-50 MHz) and the 39 MHz "Delcom" (Deleware County Emergency Communications system) is a typical victim. For the last several years, skip has been minimal because it is caused by sunspots and radio listeners know that we have been in a sunspot minimum.

But radio skip is now increasing at a rapid rate with daytime reception, especially late afternoon and early evening, often obliterated by long-distance signals. The only solution is to use higher frequencies; the higher the better from a skip-elimination standpoint. *(Item from Bob Kay, Glenolden, PA)*

The FCC is cracking down in California... An 18 month investigation culminated in the arrest of a west coast shop owner July 16 and 17, 1987. Roger S. Williams, proprietor of the Mud Shack, a San Diego CB outlet, was arrested for selling linear amplifiers and out-of-band modified CB radios.

Simultaneously, FCC officers assigned fines totalling $14,000 to seven other California CB vendors for similar infractions.

But the FCC gives up in Oregon. FCC licensed loggers in southern Oregon have been pleading with salmon trollers to stop using their frequencies for unlicensed chit-chat. The illegal use of the loggers' channels has caused serious disruptions in legitimate communications.

The loggers are concerned about the prospect of an emergency requiring reliable two-way radio. The fishermen have been ignoring the complaints and the FCC so far has said they can't do anything either.

According to Wayne Craig, engineer in charge of the Portland office, one of his investigators had died and hadn't been replaced; the other was on another assignment out of the state.

The fishermen in the meantime continue to use the radio frequencies with impunity, signing only by their first names to avoid identification and giving no locations. *(From Gary Westfall, Beaverton, OR)*

In an unrelated complaint filed with a Florida congressman, amateur radio operator Henry Luhrman, W4PZV, has cited swordfisherman off the coast with using illegal beacons in the amateur 160 meter band. The FCC says that of 85 beacons originally in use, roughly ten are left. Luhrman says the number will increase when the fall fishing season starts up again.

Speaking of fishing, remember Ray Jefferson and Jefferson-Travis? Wally Travis, skipper of the Shanghai Express party boat off Long Island Sound in the 1930s, finally agreed that his scheme of releasing carrier pigeons as an intercom wasn't the most reliable method of assuring that the message would get through.

A local radio repairman, Raymond Jefferson, came to the rescue and in 1935 the first marine radiotelephone was installed on Travis's boat. It was crystal controlled and licensed by the FCC--2738 kHz ship to ship, 2198 kHz ship to shore.

Unfortunately, one radio wasn't enough--there was no one to talk to! New York Telephone had been granted a license for a shore station but hadn't built one and the FCC refused to grant Jefferson a license.

The enterprising radioman was not to be outdone and, instead, outfitted a second boat (Walter Frankenheimer's "Ramona", a 38-foot Matthews sportsfishing boat) with a marine radio. With the number of marine radios in service now doubled, Jefferson went back to the phone company who finally capitulated and built a coastal station.

The antenna for shore station WOX was mounted atop St. Georges Theater on Staten Island and Ray Jefferson made the first paid radiotelephone call, inaugurating marine radio. Soon after, Jefferson and Travis formed their own company, producing 12 marine radios in 1937, expanding their production considerably during World War II.

Ray Jefferson now lives in retirement at Duck Key, Florida, having sold his business in 1970. But Ray Jefferson Electronics continues to move forward as a pacesetter for the marine electronics industry. *(Item received from Herbert Gesell, Amityville, NY)*

Whether for terrorism or ransom, kidnapping of key statesmen or diplomats is a serious threat to international relations and serious business to law enforcement interests.

CCS Communications Control of Port Chester, New York, has pioneered electronic security systems and now offers a line of disguised homing transmitters which may be tracked by a radio-direction-finding receiver.

The beacon-emitting transmitter may be housed in the victim's pen, wristwatch, belt, cigarette pack, or even magnetically latched under his car bumper. The tracking vehicle is equipped with four whip antennas

to resolve the bearing of the radio signal, the direction and relative course of which is displayed on a 360-degree screen.

The Rig of Tomorrow: Recently, Wayne Green, W2NSD, feisty publisher of *73* Magazine, proffered some private predictions regarding the functions of ham rigs of the future. Let's read Wayne's own words:

"How soon before we see our calls blown into a PROM by ham dealers when we buy a rig? With it sending our call using narrow-band FSK, the LCDs on our HTs and low band rigs could read out the call of every station received.

"Using voice audio redundancy reduction chips we should be able to reduce the voice bandwidth to perhaps 300 Hz, thus permitting ten times as many QSOs in the same voice bands.

"Then there's time splitting, which could allow up to seven simultaneous contacts on each channel, each seemingly duplex, giving us the ability to cram up to seven hundred times as many contacts in a band, yet with less QRM than today.

"It's been years since we hams came up with anything really new in communications. With today's microchips, perhaps it's getting time for us to start experimenting again."

When it comes to the electronics market, what are Americans buying? By midyear 1987, the Electronic Industries Association (EIA) was able to list figures representing the penetration of various electronic products into American households. There are no real surprises other than, perhaps, the degree of penetration.

Right at the top are home radios and television sets (98% each), followed closely by color TV specifically (93%) and audio entertainment systems (89%). VCRs are still edging upward (45%), but the expense of camcorders has discouraged many of us from buying them (3%).

How do scanners and shortwave radios fit into the picture? An inquiry sent by *MT* to the EIA some months ago was never answered.

It is always heartening to hear another instance in which **a ham/scanner listener saves a life.** Gene Northington, K4NWU, is a lieutenant at Fire Station No. 32 in Birmingham, Alabama. He is also an avid scanner listener, constantly on vigil for fire calls. While on his way with his children to a baseball game one evening this past July, a fire call came over his scanner dispatching fire equipment to an apartment complex just a block away.

Racing to the scene, Northington found Bernard Rayford unable to get through a broken patio door. Smashing the glass out of the door, Northington then wrapped Rayford in a curtain to keep him from being cut as he assisted the victim through the broken door.

Suffering nothing more than a cut finger, Northington then went on to the baseball game with his children! All in a day's work for a dedicated firefighter. *(Clipping sent in by Dave Beck, Birmingham AL)*

Radio also saved the lives of a shipwrecked crew. The Iron Cumberland was only able to manage a brief distress call before it sank Friday the 13th (March?), 1987, near Pitcairn Island, legendary home of the descendants of the HMS Bounty mutineers. Fortunately, their mayday call was picked up by a radio station operator on the island who then contacted the U.S. Coast Guard in Honolulu via the newly installed PEACESAT communications satellite for rescue coordination.

The 29 crew members were reported in good condition after they were recovered from the sea, adrift in lifeboats, by the British freighter Act 5 which steamed 500 miles out of its way for the rescue. *(Clipping sent by H.E.Miller, Seattle, WA)*

It was an obscure FCC monitoring post that snared the short-lived pirate "Radio New York International," although it was aboard a rusty freighter anchored off Long Island Sound, and the FCC monitoring station was located in Allegan, Michigan.

One of 13 monitoring stations across the U.S., Allegan is the official training ground for FCC engineers and technicians, a couple of whom were cruising the frequencies the night of July 23, 1987.

Right smack in the middle of a radioteletype frequency, rock and roll sprang forth from the sophisticated receiver; clearly, something unusual was going on here! Allegan alerted other FCC monitoring posts and their combined direction finding bearings pinpointed the unlicensed offender. *(Clipping sent in by L.J.Demers, Saginaw, MI)*

This year's Association of North American Radio Clubs conference was held at the Novotel Hotel in Mississauga, Ontario, a friendly city adjacent to Toronto which was also hosting British royalty and provided a hotel-rocking fireworks display during the convention.

Shortwave dignitaries attending the convention included *MT*'s publisher Bob Grove, the keynote speaker at the banquet which was attended by approximately 200 guests.

MT presented engraved plaques to Ian McFarland of Radio Canada International, voted most popular shortwave program host by the readers of *MT*; and to The British Broadcasting Corporation, voted by *MT* readers as the most popular broadcaster. This second award was accepted by the BBC's Graham Mytton.

A special ANARC award was presented to Ian McFarland by Ron Hopkins (foreground) and Don Hosner. Ian celebrated simultaneously ten years of service to the *SWL Digest*, 20 years with Radio Canada International, 25 years with the Canadian Broadcasting Corporation, his 25th wedding anniversary, and his 50th birthday! *(Photos by David Rosenthal)*

Fort Wayne, Indiana, Monitoring

by Jack Forbing K9LSB

Jack concentrates his scanner listening on 200 active channels in his area and has quite an antenna farm to do it. He uses a Grove Scanner Beam, Motorola ten-meter vertical, Polaris Adcock RDF antenna, Diamond D130 discone, amateur triband vertical, Diamond two-meter vertical, Cushcraft six-meter Yagi, Cushcraft A3 tribander, Cushcraft UHF beam, Channel Master 5094 Monitenna, and an HF inverted vee for shortwave coverage.

Jack Forbing's antenna farm

FWPD Fort Wayne Police Dept
ACPD Allen Co Police Dept
OHSP Ohio Stat Police

159.030	F1 Input FWPD
158.940	F1 Input FWPD
155.610	F1 Output FWPD
158.970	F2 Input FWPD
155.535	F2 Output FWPD
159.210	F3 Input FWPD
155.790	F3 Output FWPD
158.850	F5 FWPD
158.730	F4 Input FWPD
155.670	F4 Output FWPD
156.090	F5 FWPD
155.820	Baer Field PD KZJ481
154.860	ACPD AC Jail
155.130	ACPD Signal 60
155.250	ACPD F1 Base/Rpt
154.770	ACPD
155.340	IHERN
460.200	FWPD
460.475	ACPD 62A Base
42.120	ISP
42.160	ISP
42.420	ISP
42.260	ISP
155.370	Point-to-point
462.950	EMS Med Ch9
154.890	ACPD F1 mobiles
154.325	Red 2 FWFD
154.085	Red 4 FWFD
158.760	Green
154.415	AC White Chan
154.010	AC Co Fire Disp
155.475	Ileen
154.190	Red 1 FWFD
460.275	FWFD Fire Command
462.675	REACT
153.950	Wayne Twp
155.445	ISP
154.160	Red 3 FWFD
158.880	Baer Field PD KZJ481
132.150	Chicago
163.960	FBI
121.900	Ground Control
126.600	App/Dep Baer Field
119.850	Chicago Center
119.550	FWA
129.950	FAA
122.800	UNICOM
119.100	FWA Tower
122.000	Natl Flight Watch
122.900	FAA
156.000	Baer Field PD /m
155.025	KVS448 Civil Defense
158.500	FWPD m/m
154.280	Mutual Aid Fire
163.200	USMARS
460.350	FW City Govt Auto-patch
460.850	Peters Broadcast Eng
153.740	FWFD
154.250	Wayne Twp FD
154.445	FWFD
155.865	KNAH400 LG
158.805	KXB444 LG
463.375	KXE780 LG
463.700	KVU366 LG
453.775	KVU367 LG
52.525	National Simplex
122.950	UNICOM FSS-FWA
155.850	
148.100	ANG
148.175	ANG
148.550	ANG
149.275	ANG
150.150	ANG
120.200	Smith Field A/D
126.600	Smith Field A/D
127.550	Smith Field A/D
44.740	OHSP
45.260	OHSP
52.680	Angola
143.990	USA MARS
150.225	ANG
150.345	ANG
160.440	N&W RR
160.800	Conrail
160.690	Secret Service
163.750	FBI KDX781
163.810	US Marshall
164.600	US Marshall KRB220
165.375	ATF
165.500	FAA
167.560	FBI KDX781
157.600	FBI KDX781
450.150	TV33
460.225	FWPD
460.250	FWPD
127.550	Chicago Center
134.050	FAA
124.750	Clearance Delivery
123.300	FAA
123.500	FAA
129.500	FAA
130.200	Maintenance
130.400	FAA
131.550	FAA
129.650	FAA
130.300	FAA
461.325	
463.325	Parkerson
463.275	
458.375	
453.500	KSN697 LG
168.935	Autopatch
168.950	
152.240	KQZ305
462.575	Agric
450.450	Chan 21
464.575	Glenbrook Sq
464.025	Citizens Cable
162.550	NOAA WXJ58 FWA
464.400	D&L Communications
32.500	USA
34.350	USA
38.300	USA
40.800	USA
44.740	OHSP
45.260	OHSP Lima
160.320	N&W RR
160.420	RR
160.710	Penn RR
161.070	Conrail
161.250	RR
162.685	AF-1
37.340	State Hwy
450.050	WQHK/WMEE News KOS371
167.210	FBI
167.760	FBI
167.700	FBI
154.815	NHPD
161.640	WQHK/WMEE PRGM KVY911
161.670	CH21
161.700	WIFF
161.730	WOWO
451.350	GTE
158.160	NIPSCO
160.830	Penn RR
462.700	FW Comm Cent
463.875	Canterbury
161.900	Marine Tel OH River
452.950	FW newspapers
47.280	Hwy
47.360	Hwy
47.580	School buses
151.130	Allen Co Hwy
151.310	KJI381 FW Park Dept
155.745	IUPU Police
156.225	Street Dept
37.700	I&M
453.325	CD
453.375	Co Commissioners
453.500	Co Commissioners
460.550	FW school buses
465.475	ACPD 62A mobiles
155.400	KNHG710 in state rescue
155.955	In LG KJI353
453.900	KSH529 FW Telecomm
453.950	KSH529 FW Telecomm
159.240	KNHQ245 in Nat Resource
32.350	USA
163.200	KRB200 U.S. Marshall
165.235	KLR756 DEA
165.290	KLR756 DEA
418.050	KLR753 DEA
418.200	DEA Ch2
418.625	DEA Ch1
418.675	DEA Ch4
418.750	DEA Ch3
418.800	DEA Simplex car-to-car
418.825	DEA Ch5
418.900	DEA Surveillance
418.950	DEA Ch6
418.975	KLR753 DEA
419.000	DEA
155.280	IHERN 2 Tactical field
462.975	Med 10
463.000	Med 1
463.025	Med 2
463.050	Med 3
463.075	Med 4
463.100	Med 5
463.125	Med 6
463.150	Med 7
463.175	Med 8
156.850	USCG
161.500	USCG
123.450	Unofficial air chat
162.475	NOAA NW Ind
162.400	NOAA Dayton
444.625	Hams Inc

Southern Illinois Scanning

by Kurt Stoudt
Arlington Hts, IL

IESDA	**(Ill Emergency Services Disaster Admin.)**
SP	**State Police**
Mboro	**Murphysboro**
Cdale	**Carbondale**
KC	**Kansas City**
SIU	**Southern Ill University**
31.200	WPSD Tactical Comm
34.830	Crab Orchard Wildlife
39.460	SP Point to point
39.500	SP Base-car, car-car
39.600	Mboro Secret Squirrel freq
39.620	Herrin PD
41.060	FCC lowband ops
42.500	SP car-car + bdcst
42.600	SP base-car, car-base
42.680	Dist 13 car-base
43.140	Construction traffic (SIMONDS)
43.340	Dist 11 car-base
45.240	ESDA Point-point
45.280	IESDA
45.369	IESDA
45.400	IESDA
45.440	ESDA Point-point
45.560	Proposed IESMA ESDA intersystem
47.300	Hwy Dept System output
47.420	Natl Red Cross Mutual Aid
48.140	CIPS
52.525	Amateur Skywarn Liaison
118.200	Aviation Carbondale Tower
119.400	" Marion Approach
121.500	" ELT & Emerg Comm Freq
121.700	" Marion Ground
121.800	" Carbondale Ground
122.800	" Unicom - non-tower apts
122.900	" Plane to plane
122.950	" Unicom - Tower apts
125.300	" KC Center, Marion VORTAC
126.900	" Marion Tower
127.700	" KC Center, Perry Co VORTAC
146.520	Amateur simplex
146.640	Carbondale SIARS Rptr
146.670	Herrin Area Rptr Club
146.730	SIUARS Rptr
146.805	W. Frankfort Rptr
146.850	MARA Rptr
146.880	Williams Hill Rptr
146.940	Cape Rptr
147.210	Marissa Rptr
147.345	Trigg Hill Rptr
147.390	S. Illinois Skywarn System TTY Data
147.540	SARA Simplex freq
148.010	U.S. Army MARS simplex
151.625	High band itinerant freq
151.895	J+O comm, PL 162.2
151.955	Walker Comm
152.510	Cdale Mobile phone base output
152.840	Cdale paging Xmitter
153.890	Mboro FD
153.905	Williamson Co Govt
153.995	Alex Co 155.025 Rptr input
154.025	Cdale Public Works
154.040	Jackson County ESDA
154.055	Cape Co Fire (+ES)
154.070	Coal Belt Fire Dpts
154.100	W. Frankfort PD
154.115	Mboro ESDA
154.265	Nifern, proposed statewide
154.310	Fire freq
154.430	Salem fire freq
154.640	Carbondale PD F2
154.665	DCI F1
154.680	MEG surveillance
154.695	Williamson Co Detectives
154.710	MEG operations
154.740	Galatin Co Sheriff
154.755	Carbondale PD F1
154.770	Saline Co Sheriff
154.785	Radolph Co Sheriff
154.800	Benton PD traffic
154.815	E. Frank Co Central Disp
154.845	John A. Logan Security
154.860	Perry Co. Sheriff
154.905	IDA Units (DCI F2); SP
154.935	ISP Dist 13 (DuQuoin)
154.950	DCI F3
154.965	Marion PD
154.980	Williamson Co Govt
154.995	Franklin Co Sheriff
155.010	Jackson Co Sheriff
155.025	State Mutual Aid ESDA
155.055	IREACH
155.070	Williamson Co Sheriff
155.085	ESDA Rptr
155.100	Jackson Co Ambulance pager
155.115	MDH Airport Authority
155.205	West Bus, Makanda
155.220	Ambulance Mutual Aid (Jackson Co)
155.340	Carbondale Trauma; Amb to hosp
155.370	All depts point to point
155.415	Johnston City + Herrin PD
155.430	Duquoin PD
155.460	SP Chan 7 (point-to-point)
155.475	ISPERN (NLEEF) DCI F4
155.505	ISP Mobile rptrs
155.565	Mboro PD
155.640	Carbondale PD F2
155.865	Salem ESDA
156.090	Williamson Co Sheriff
156.300	Marine Intership Safety Ch6
156.425	" Non-commercial Ch68
156.700	" Port Ops Ch14
156.800	" Distress & Calling Ch16
157.100	" Govt Ch22
157.200	" Public Ch24
157.250	" Public Ch25
157.770	Cdale mobile Tx base input
161.190	IL Cent road
161.700	WHPI Marti Pt-to-pt
161.760	WDDD Pt-pt link (Marti)
162.400	NOAA weather
162.425	NOAA weather (Goreville)
162.475	NOAA weather
162.550	NOAA weather
163.200	US Marshals rptr
163.4125	Corps of Eng simplex
163.5375	Corps of Eng rptr
164.175	Corps of Eng simplex
164.200	Corps of Eng simplex
165.950	IRS tactical
166.4625	IRS tactical
167.000	IRS tactical
167.050	FCC hi-band simp + rptr output
167.725	FBI Carbondale off
170.025	Marion Fed Prison
170.875	Marion Fed Prison
172.800	FCC hi-band rptr input
223.500	Amateur simplex
223.540	SIARS control link
223.620	Williams Hill cntrl lin
224.700	Marrissa 220
224.860	Bald Knob rptr
224.940	Harrisburg rptr
444.025	Alexander Co rptr
444.400	Bald Knob rptr
449.9725	So IL Skywarn Sys da link
450.025	WSIU TV Marti
450.6125	WPSD tactical
451.100	Highway/power companies
451.350	Telephone Co maintenance
453.100	Hiway Dept Comm al power co
453.600	SIU physical plant
453.650	SIU transportation
453.800	SIU transportation service
453.875	Vienna Correctional C
453.900	SIU Police
461.100	Carbondale Comm Rp
461.200	DuQuoin Comm Rptr
451.250	Giant City Comm rpt
4661.675	KFVS tactical
462.825	SIU paging
463.650	Wayside comm rptr
468.175	Jackson Co spec eme

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AMVER

In order to increase the number of distressed ships which are assisted each year, the U.S. Coast Guard, in 1955, set up the Automated Mutual-Assistance Vessel Rescue System, known as AMVER. This system is a computerized method of taking information supplied by ships about their course, speed, and destination, and when an emergency arises, using that information to determine which ships are in the best positions to assist. Additional information is stored in the computer about the ships' facilities for search and rescue.

The AMVER program extends around the world, and is participation is compulsory by commercial ships making transoceanic voyages or voyages of more than 24 hours between ports. Many other vessels also participate in the program and help to make it extremely successful.

For those monitoring maritime radio traffic, the AMVER messages can yield some interesting information, such as the destination of ships and the route they are taking. There are four possible types of radio messages which can be field, and each of these has its own purpose. First we will look at the messages and then the communications system.

Message Types:

The first type of message is called type 1 and in effect is a sailing plan. The following information is given, the name and call sign of the ship, her position and the date and time of the position, her intended sailing plan, her speed, her destination and ETA, the call sign of the coast station being guarded during the voyage, and whether there is any medical personnel aboard. This message is either filed just before the vessel's departure, or as soon as possible thereafter.

Type D is the next message, which is a deviation report. This message should be sent whenever a change in course, speed, destination, etc., will cause the predicted position of the ship at any time to be more than 25 miles from her actual position. Other than the name and call sign of the ship, the type D message need only contain the information which has changed from that sent previously in the sailing plan.

The type 2 message is a position report which should be sent every 36 hours during the voyage. This message should contain the name and call sign of the vessel, her position and the date and time of the position, and the call sign of the coast station being guarded, and medical personnel aboard. In addition to these reports, ships' positions are also extracted from ship weather observations sent by those ships participating in the International Weather Observation Programme.

The last type of report is type 3, the arrival report. Along with name and call sign of the vessel it should contain the position of the ship and the date and time of that position. In this case it should indicate the name of the port and the time of arrival. This report is used to increase the accuracy of the plot being maintained by the computer, although the computer will automatically end the plot when it predicts the ship's arrival in port.

The computer takes the information from these messages, plus ship's positions from weather observations and maintains plots of the predicted positions of participating ships. When a distress call is received the appropriate Search and Rescue authority can get information about the positions of the ships which are best in a position to render assistance, along with information about the Search and Rescue characteristics of the ships.

In order to maintain accurate information, messages must be sent regularly, and there there must be a good communications network. Many countries have coast stations which accept AMVER messages at no charge to the ship, and forward these to the appropriate authorities in their own country, who in turn send them on to the U.S. Coast Guard at Governors Island. While space will not allow detailed information to be given here about each station, below is a list of the stations which do accept AMVER messages.

Information about some of these stations has been given in past columns, and it is certain that information will be forthcoming about others in the future.

Coast Stations Accepting AMVER Messages

LGA Alesund R, Norway
GLV Anglesay R, U.K.
CBA Antofagasta R, Chile
EAD Aranjuez R, Spain
EDZ Aranjuez R, Spain
ZLD Auckland R, New Zealand
ZLB Awarua R, New Zealand
LGN Bergan R, Norway
LGP Bodo R, Norway
NMF Boston Comm Station
VAG Bull Harbour CG R, BC, Can
VIO Broome R, Australia
VFC Cambridge Bay CG R, NWT, Can
NPN 60 Canal R, Panama
VIC Carnarvon R, Australia
VOK Cartwright CG R, Nfld, Can

ZLC Chatham Is R, New Zealand
VOO Comfort Cove CG R, Nfld, Can
VFU6 Coppermine CG R, NWT, Can
GCC Cullercoats R, U.K.
VID Darwin R, Australia
LGZ Farsund R, Norway
LGL Floro R, Norway
VFF Frobisher CG R, NWT, Can
LPD General Pacheco R, Argentina
SAG Gothenberg R, Sweden
VCN Grindstone CG R, Que, Can
NRV Guam Comm Station
HCG Guayaquil R, Ecuador
VCS Halifax CG R, NS, Can
LGI Hammerfest R, Norway
LGH Harstad R, Norway
NMA Honolulu Comm Station
GKZ Humber R, U.K.
GIL Ilfracombe R, U.K.
VFA Inuvik CG R, NWT, Can
GUD Jersey R, U.K.
JMJ Kagoshima R, Japan
JGD Kobe R, Japan
NOJ Kodiak Comm Station
JNX Kushiro R, Japan
GLD Lands End R, U.K.
DZG Las Pinas R, Phil
DXZ Lyngby R, Denmark
EJM Malin Head R, Ireland
NMA Miami Comm Station
JNT Nagoya R, Japan
FJA Nahina R, Tahiti
ZSJ Navicomcen Cape, S.Af.
NMG New Orleans Comm Station
GNI Niton R, U.K.
JNR Noji R, Japan
DAN Norddeich R, Germany
GNP N Foreland R, U.K.
GNE Oban R, U.K.
C7L Ocean Stn Vessel Lima - 57°N, 20°W
C7M Ocean Stn Vessel Mike - 66°N, 2°E
C7R Ocean Stn Vessel Romeo - 47°N, 17°W
JNB Okinawa R, Japan
LFO Orlandet R, Norway
KUO Pago Pago Comm Stn, Am Samoa
VIP Perth R, Australia
GKA Portishead R, U.K.
GKB Portishead R, U.K.
GKC Portishead R, U.K.
GKD Portishead R, U.K.
GKE Portishead R, U.K.
GKG Portishead R, U.K.
GKH Portishead R, U.K.
GKI Portishead R, U.K.
GKJ Portishead R, U.K.
GKK Portishead R, U.K.
GKM Portishead R, U.K.
GKN Portishead R, U.K.
GKO Portishead R, U.K.
GKP Portishead R, U.K.
GKS Portishead R, U.K.
GPK Portpatrick R, U.K.
NMN Portsmouth Comm Stn
VAJ Prince Rupert CG R, BC, Can
VIR Rockhampton R, Australia
LGQ Rogaland R, Norway
LFW Rogaland R, Norway
LGU Rogaland R, Norway
LFU Rogaland R, Norway
LFN Rogaland R, Norway
LGB Rogaland R, Norway
LFB Rogaland R, Norway
LGJ Rogaland R, Norway
LFJ Rogaland R, Norway
LFI Rogaland R, Norway
LFT Rogaland R, Norway
LGK Rogaland R, Norway
LFF Rogaland R, Norway
LGG Rogaland R, Norway
LFG Rogaland R, Norway
IRM Rome R, Italy
LGD Rorvik R, Norway
VOM St. Anthony CG R, Nfld, Can
ZBM St. George R, Bermuda
VON St. John's CG R, Nfld, Can
VCP St. Lawrence CG R, Nfld, Can
NMC San Francisco Comm Stn
NMR San Juan Comm Stn
EAT Santa Cruz de Tenerife R, Spain
PCG Scheveningen R, Netherlands
PCH Scheveningen R, Netherlands
VCK Sept Iles CG R, Que, Can
JNN Shogama R, Japan
VOJ Stephenville CG R, Nfld, Can
GND Stonehaven R, U.K.
3DP Suva R, Fiji
VCO Sydney CG R, NS, Can
VIS Sydney R, Australia
EAC Tarifa R, Spain
VII Thursday Is R., Australia
LGTf Tjome R, Norway
VAE Tofino CG R, BC, Can
jVIT Townsville R, Australia
LGE Tromso R, Norway
EJK Valentia Is
CBV Valparaiso R, Chile
VAI Vancouver CG R, BC, Can
LGV Vardo R, Norway
VAK Victoria CG R, BC, Can
EAF Vigo R, Spain
ZLW Wellington R, New Zealand
GKR Wick R, U.K.
VAU Yarmouth CG R,s NS, Can
JDT Yokosuka R, Japan ■

Excerpts from THE SHORTWAVE DIRECTORY

Bob Grove, WA4PYQ

Maritime Communications

To accompany the High Seas column on AMVER, this month's SWD excerpt lists the shortwave frequencies used by the participating coastal stations.

Atlantic Communications

Western North Atlantic

CALL/LOCATION	COAST	SHIP
CANADA		
(See listings under Canadian section, Can Coast Guard)		
UNITED STATES		
NMA Miami, FL	6506.4	6200.0
NMF Boston,MA	6506.4	6200.0
NMG New Orleans, LA	4428.7	4134.3
	6506.4	6200.0
	8765.4	8241.5
	13113.2	12342.4
NMN Portsmouth, VA	8465.0	8 MHz
	12718.5	12 MHz
	16976.0	16 MHz
	4428.7	4134.3
	6506.4	6200.0
	8765.4	8241.5
	13113.2	12342.4
NMO Honolulu,HI	2670	2182
	8650.0	8 MHz
	12899.5	12 MHz
	22476.0	22 MHz
	4428.7	4134.3
	6506.4	6200.0
	8675.4	8241.5
KUQ Pago Pago, Am Samoa	5475	4 MHz
	6361.0	6 MHz
	8585.0	8 MHz
	12871.5	12 MHz
PANAMA		
HPN60 Canal Radio	4240.0	4 MHz
	6467.0	6 MHz
	8607.0	8 MHz
	12873.5	12 MHz
	17128.5	16 MHz
	22412.0	22 MHz
CHILE		
CBV Valparaiso	4349.0	4 MHz
	8478.0	8 MHz
	12714.0	12 MHz
	16945.0	16 MHz
	22473.0	22 MHz
ECUADOR		
HCG Guayaquil	8476	8 MHz
	12711	12 MHz
	16948	16 MHz

Eastern North Atlantic

CALL/LOCATION	COAST	SHIP
NORWAY		
LGA Alesund	1722	2442
LGN Bergen	1743	2463
LGP Bodo	2656	2139
LGZ Farsund	1750	2470
LGL Floro	2649	2132
LGI Hammerfest	1722	2442
LGH Harstad	1736	2456
LFO Orlandet	2635	2118
LGQ Rogaland	1729	2449
LFW	4325.0	4 MHz
		4185
LGU	6432.0	6 MHz
		6467
		6277.5
LFU	6467.0	6 MHz
LFN	8527.5	8 MHz
LGB	8574.0	8 MHz
		8370
LFB	8678.0	8 MHz
		8678
LGJ	12727.5	12 MHz
LFJ	12876.0	12 MHz
		12555
LFI	12961.5	12 MHz
LFT	16952.4	16 MHz
LGX	17074.4	16 MHz
		16740
LFF	17165.6	16 MHz
LGG	22425.0	22 MHz
LFG	22473.0	22 MHz
		22242
LGT Tjome	1736	2456
LGE Tromso	1750	2470
LGV Vardo	1729	2449
	2182	
SWEDEN		
SAG2 Gothenburg	4262.0	4 MHz
SAG3	6372.5	6 MHz
SAG4	8498.0	8 MHz
SAB4	8646.0	8 MHz
SAG6	12880.5	12 MHz
SAB6	12755.5	12 MHz
SAG8	17079.4	16 MHz
SAG9	22413.0	22 MHz
SAG25	25461.0	25 MHz
NETHERLANDS		
	1764	2030
PCH Scheveningen	2824	2520
	4369.8	4075.4
	4419.4	4125
	6509.5	6203.1
	6521.9	6215.5
	8780.9	8257
	13162.8	12392
	17294.9	16522
	22658.0	22062
	6406	4 MHz
	12966	12 MHz
PCH20	4250.0	4 MHz
PCH40	8562.0	8 MHz
PCH41	8622.0	8 MHz
PCH42	8654.4	8 MHz
PCH50	12768.0	12 MHz
PCH51	12799.5	12 MHz
PCH52	12853.5	12 MHz
PCH60	16902.0	16 MHz
PCH61	17007.2	16 MHz
PCH62	17104.2	16 MHz
PCH70	22324.5	22 MHz
PCH71	22539.0	22 MHz
PCG41	8796.4	8272.5
PCG51	13138.0	12367.2
PCG61	17341.4	16568.5
PCG71	22608.4	22012.4
IRELAND		
EJM Malin Head	1841	2182
EJK Valentia Is	1827	2182
ITALY		
SPAIN		
EAC Cadiz	4275.5	4 MHz
	6505.5	6 MHz
	8726	8 MHz
	13056	12 MHz
	17175.2	16 MHz
	22384	22 MHz
EAD Aranjuez	4349	4 MHz
EAD2	6382.22	6 MHz
EAD3	8682	8 MHz
EAD44	12887.5	12 MHz
EAD4	13065	12 MHz
EAD5	17184.8	16 MHz
EAD6	22446	22 MHz
EAF Vigo	6498.5	6 MHz
	8473	8 MHz
	13092	12 MHz
	17280.8	16 MHz
EAT Santa Cruz de Tenerife	6498.5	6 MHz
	8473	8 MHz
	13092	12 MHz
	6942.8	16 MHz
EDZ	4269	4 MHz
EDZ2	6400.5	6 MHz
EDZ4	8618	8 MHz
EDZ5	12934.5	12 MHz
EDZ6	17064.8	16 MHz
EDZ7	22533	22 MHz
GREAT BRITAIN		
(Consult ITU listings for frequencies)		
GKA Portishead		
GKR Wick		
GND Stonehaven		
GCC Cullercoats		
CKZ Humber		
GNF Northforeland		
GNI Niton		
GLD Lands End		
GIL Ilfracombe		
GLV Anglesey		
VPK Portpatrick		
GHD Hebrides		

South Atlantic

CALL/LOCATION	COAST	SHIP
ARGENTINA		
LPD68 Gen.Pacheco	4268.0	4 MHz
LPD86	8646.0	8 MHz
LPD88	12988.5	12 MHz
LPD46	17045.6	16 MHz
	18081.5	
LPD91	22419.0	22 MHz
	20520	
LOL	17665	
LPL	17285.7	
LPL5	17232.9	
SOUTH AFRICA		
ZSJ2 Navcomcen Capetown	4145	4 MHz
	4283	4 MHz
ZSJ3	6386.5	6 MHz
ZSJ4	8566.0	8 MHz
ZSJ5	12849.0	12 MHz
ZSJ6	17132.0	16 MHz

Pacific Communications

Eastern Pacific

CALL/LOCATION	COAST	SHIP
CANADA		
(See listings under Canadian Coast Guard)		
UNITED STATES		
NOJ Kodiak, AK	2670	2182
	6506.4	6200.0
NMC San Francisco CA	2670	2182
	6383.0	6 MHz
	8574.0	8 MHz
	16800.9	16 MHz
	4428.7	4134.3
	6506	6200
	8765.4	8241.5
	13113.2	12342.4
NMO Honolulu,HI	2670	2182
	8650.0	8 MHz
	12899.5	12 MHz
	22476.0	22 MHz
	4428.7	4134.3
	6506.4	6200.0
	8675.4	8241.5
KUQ Pago Pago, Am Samoa	5475	4 MHz
	6361.0	6 MHz
	8585.0	8 MHz
	12871.5	12 MHz
PANAMA		
HPN60 Canal Radio	4240.0	4 MHz
	6467.0	6 MHz
	8607.0	8 MHz
	12873.5	12 MHz
	17128.5	16 MHz
	22412.0	22 MHz
CHILE		
CBV Valparaiso	4349.0	4 MHz
	8478.0	8 MHz
	12714.0	12 MHz
	16945.0	16 MHz
	22473.0	22 MHz
ECUADOR		
HCG Guayaquil	8476	8 MHz
	12711	12 MHz
	16948	16 MHz
FRENCH POLYNESIA		
FJA Mahina Tahiti	2620	2182
	8674	8230
	8805.7	8281.8
FIJI		
3DP Suva	2111	2182
	6215.5	6215.5
	8690.0	8 MHz
	12700.0	12 MHz
AUSTRALIA		
VIS Sydney	2201	2182
	4428.7	4125.0
VIS53	4245.0	4 MHz
	6512.6	6215.5
VIS3	6464.0	6 MHz
VIS5	12952.5	12 MHz
	12979.5	
VIS6	17161.3	16 MHz
	17194.4	
VIS26	8421.0	8 MHz
	8452.0	
VIS42	22474.0	22 MHz
VIP Perth	2201	2182
VIP	4428.7	4125.0
	6512.6	6215.5
VIP3	8597.0	8 MHz
VIP4	12994.0	12 MHz
VIP5	16947.6	16 MHz
VIP6	22315.5	22 MHz
VIP7	4229.0	4 MHz
VIO Broome	2201	2182
	6407.5	6 MHz
	4428.7	4125.0
	6512.6	6215.5
VIC Carnarvon	2201	2182
	6407.5	6 MHz
	4428.7	4125.0
	6512.6	6215.5
VID Darwin	2201	2182
	6463.5	8 MHz
	4428.7	4125.0
	6512.6	6215.5
VIR Rockhampton	2201	2182
	4255.6	4 MHz
	4428.7	4125.0
	6512.6	6215.5
VII Thursday Is	2201	2182
	6333.5	8 MHz
	4428.7	4125.0
	6512.6	6215.5
VIT Townsville	2201	2182
	6463.5	8 MHz
	4428.7	4125.0
	6512.6	6215.5
NEW ZEALAND		
ZLD Auckland	2207	2182
	4143.6	4125
	6218.6	6215.5
ZLB Awarua	2423	2182
	4143.6	4125
ZLB2	4277.0	4 MH
ZLB3	6393.5	6 MH
ZLB4	8504.0	8 MH
ZLB5	12740.0	12 MH
ZLB6	17170.4	16 MH
ZLB7	22533.0	22 MH
ZLW Wellington	2153	2182
	4143.6	4125
ZLC Chatham Is	2104	2182

Western Pacific

CALL/LOCATION	COAST	SHIP
UNITED STATES		
NRV Guam	2670	2182
	8570.0	8 MH
	12743.0	12 MH
	17146.4	16 MH
	22567.0	22 MH
		6200.0
	6506.4	12342.4
	13113.2	
PHILLIPINES		
DZG Las Pinas	6441.0	6 MH
	8632.0	8 MH
	12948.0	12 MH
	17176.0	16 MH
	22502.0	22 MH

UTILITY INTRIGUE

Don Schimme
516 Kingsley Road SW
Vienna, VA 2218(

MAIL CALL

It is always a pleasure to hear from readers and particularly those new to the hobby. Most recently I received a note from Matt Hastan, TN, in which he indicated he was a sophomore in high school and since becoming interested in SWLing he has been encouraging all of his friends to also take up the hobby.

Matt forwarded some information on two activities he had monitored. The first was on 7465.5 kHz at 0230 (UTC?) on USB when he heard testing on this Department of Energy frequency. The second net copied was on 6761 kHz at 0115 (UTC?) on USB with UTAH Control working UTAH 1 and then UTAH 1 making contact with FIRELIGHT 1. The net was not identified.

A couple of readers have asked me about a term "Mission Radio System" that they ran across. This designates the radio system for HF secure or non-secure voice point to point communications between USSOUTHCOM, its components, and U.S. Military Missions throughout Central and South American and the Caribbean areas. An Air Force station (the only AF station on the net) acts as Net Control Station (NCS) and it is located at Howard Air Force Base, Panama. USSOUTHCOM has operational control of the system. Air Force Communications Command provides operation and maintenance for the NCS but maintenance only for the other 21 low power stations.

SPECIAL INTEREST ITEMS

6944.1 kHz 032018Z CW

I came upon this very slowly sent transmission which was noted as being Cut Numbers. The transmission consisted of three groups UND UNDAW GTDTN and was repeated until 2019Z. There was approximately a one minute pause and at 2020Z GTI AAIWT WURRT was sent and repeated until 2022Z at which time the transmission ceased.

6989.8 kHz 010140Z CW

An unidentified station was sending B B B B etc. and then sent BT TNR DE TAN QRU QTC NR 4592 URGENTE GR 9 QTR 2141 NR31 NR5 NR87 AL M/N PLAYA LARGA DEL MGR BT QSM BT and at this point went into a text of 9 groups of 5F. After a short pause, TAN again sent a string of B's and sent the message again; this time however, the QTR was changed to 2146.

It was quickly apparent that each time the message (with the identical text and heading, except for QTR designation) was sent, the QTR was updated. I do not understand the purpose of the repeated transmissions with just the QTR being changed but it certainly seems like this activity may very well be a practice net.

7905 kHz 072316Z CW

When I cut in on this transmission a string of K's was being transmitted. This was followed by GI7576 K K K K K GI7576 K K 19248 43182 97818 K K K GI7576 and then continued with a lengthy string of K's. At 2318Z the groups were changed to K K K 45453 K K 57710 51656 and this sequence repeated until 2320Z at which time the K's were again sent but now at a slower rate than previously. The K's continued and after listening to many minutes of them I discontinued coverage of the frequency. I should point out that it is very possible the first copied group of GI7576 might be 77576 with the GI being the faulty keying of the digit 7.

10118 kHz 1400128Z CW

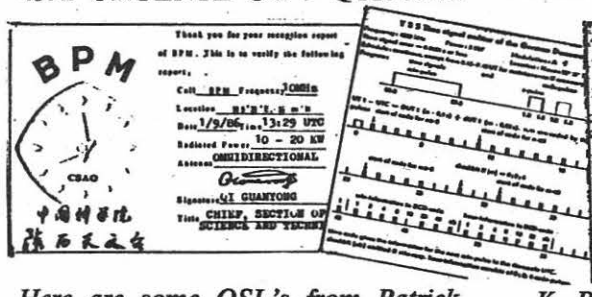
I have no clues regarding the purpose of this monitored sequence. The dashes were very slowly sent with a definite space between each grouping. The sequence was as follows: five dashes, space, six dashes, space, six dashes, space, seven dashes and down at 0129Z.

14547 kHz 121436Z RTTY 75-850

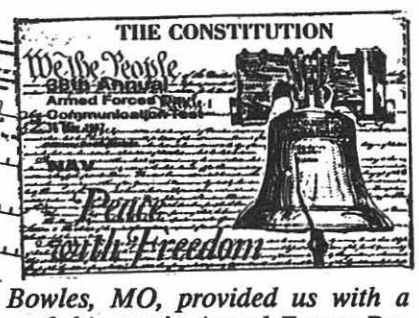
This was a garbage (encrypted) transmission but in copying the signal for quite some time it was readily evident that a possible message separator was used between individual messages because of the appearance at various intervals of a string of Y's. I stayed with this frequency for close to an hour but did not come up up any identifiable details. ■

MAY 1987 LOGGINGS

KHZ	DTOI	MODE/IDENTIFICATION/COMMENTS
396	010121	MCW/APH Beacon, Ft. A.P. Hill (Bowling Green) VA
399	010123	MCW/NHK Beacon, Patuxent River NASj (Trapnell Field) MD
3645.8	021144	RTTY 50-425/CTK (Czech News Agency) running RY's
4622	050424	CW/No calls/5L grps
6276.4	022325	CW/95DGI DE 94PLL 2/4/6 23 R (poss Navy freq-Spain)
6297.5	072246	CW/Unid stn sending 5F WX msg
6329	061540	RTTY 75-170/Coded WX
6386	072243	CW/CQ DE ZSJ3, NAVCOMCEN (Silvermine) Cape Radio, South Africa
6463.5	072240	CW/C1 DE HKB, Baranquila, Colombia
6521.6	072234	USB/OM & YL (both EE) talking re conditions of boats in marina & that some unid boats going fishing & would be out about 10 days
7659.6	020108	CW/DE DAC DAC DAC MLO MLO VVV/vy fast & brief chatter in Spanish, then off
6982.5	020059	CW/VVV DE FUO, Toulon Naval Rdo, France
7080	082324	CW/W1AW (ARRL HQ Stn) with practice tfc at various speeds
7405.3	071334	RTTY 50-425/RCC-LA HABANA CUBA TESTING TO ADX CNTL ITT/WC NY & sends RY's
7424.3	072259	RTTY 50-425/5NL, Lagos Air, Nigeria, running RY's
7527	070008	CW/No calls/Cut nbr grps, down with AR AR AR SK SK SK
7705	072303	CW/WX in EE for Caribbean area, this prob NMN NAVCOMMSTA Portsmouth, VA
7755.2	082336	RTTY 50-170/Commercial telegrams in SS addressed to various locations & persons in Cuba
7785.9	072312	CW/UAHY DE RMZT, Soviet ships, exchange QRU's
8715	140150	RTTY TOR/ARQ-170, Press in EE
10136	140123	RTTY 50-425/TNL96-TNL97 (Brazzaville, Congo) running RY's
10386	140115	CW/No calls/5L grps, 4 spec charac AA OE OT IM
10460	140114	USB/YL-GG with 5F grps
10534.1	021156	RTTY 75-850/Coded WX msg followed by English lang WX forecast for Labrador. This was Canadian Forces Metoc Centre, Halifax, Canada
11242.6	071553	USB/SKYBIRD THIS IS PAPPY 23, General Net Air/Gnd callsign used by AC when trying contact any SAC Gnd stn. This is SAC Alpha freq.
12073	151242	CW/No calls/5L grps, pauses after every 10 grps
12248	151247	RTTY 50-425/5F grps & Korean PT, Pyongyang appeared in several PT smgs
12518	140210	RTTY 50-170/Russian PT
13061.8	061603	CW/COKZ DE CLA, Havana tells Cuban ship to QSY to 16768
13152	121220	USB/OM & YL in conversation in Italian language
13348.6	041648	USB/Two OM-SS (poss Mexican AF link), stronger stn giving WX to other stn
13596	041644	RTTY 50-170/CTK (Czech News Agency) with Press in English
13730	121522	RTTY 50-425/Press in French (AFP)
13845	121526	RTTY 75-850/DE KRH51, AmEmb, London, with Quick Brown Fox tape
13859	121527	CW/Poss CLP1 with Spanish PT poss in connection with a prev sent msg
13862	121542	CW/No calls/stn sending cut nbr tfc believed use 34567NUDET, stn moved to 13871 sending V's and DE VHB. Poss Vietnamese Dipl link
13900	121336	RTTY 75-425/Many msgs containing DOB, POB, other personal data. Visa applications? BON at end of each msg
13999	121330	RTTY 50-425/DIPLO Paris with review of Soviet Press in FF
14458.3	021149	RTTY 50-425/Y7A49 Y7A57 Y7A30 (East German Diplo) with 5L grps. HEL in heading, possibly abbrev for Helsinki. After tfc runs callsigns & RY's
14490	121443	RTTY 50-425/TASS (Soviet Press) in EE
14681	121425	CW/76Z VV & repeats callup
14814	121414	RTTY 50-425/CLP1(?) with RY's
14884	131308	RTTY 50-425/Press in EE
14844	141438	USB/YL-GG with 5F grps
14956	121710	CW/5L grps, cut nbrs. Sending stn is prob CLP1, Havana
18038	121325	RTTY 75-850/AMVER msgs
18495	121319	RTTY 50-425/MAP (Morocco News Agency) with news in EE
18622	121303	RTTY 50-425/tfc in SS addressed to EMBACUBA Sierra Leone & Guinea Bissau. This prob CLP1, Havana
18656	131320	RTTY 50425/MFA Havana to Cuban Embs overseas with press in SS
18692	111326	RTTY 45-425/Lengthy string of RY's foll by string of Z's, then AS and then back to RY's. This probably Havana/Angola (Cuban Mil) link
18698	141208	TTY 50-425/Press (West German Agency) items in EE re Iran/Iraq war
22444	141156	CW/DE EAD6 EDZ7, Aranjuez, Spain
22563	141158	CW/DE GKE7, Portishead, England



Here are some QSL's from Patrick O'Conner, NH, that he received from two time signal stations.



K. Bowles, MO, provided us with a copy of this year's Armed Forces Day QSL card.

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CQ CQ CQ DE NMO NMO NMO OLH SITOR 9716/13084.5/22574.5 KHZ
OBX SITOR 8357/12504.5/22205.5 KHZ

CQ CQ CQ DE NMO NMO WEATHER
=
EEEEEEEE 052300GMT
HIGH SEAS FORECAST
NATIONAL WEATHER SERVICE HONOLULU HI
2300 UTC TUE MAY 05 1987
NORTH PACIFIC EQUATOR TO 50N BETWEEN 140W AND 160E
SYNOPSIS 1800 UTC MAY 05 AND FORECAST VALID 0600 UTC MAY 07
WARNINGS.
GALE.
LOW 994MB 50N 149W MOVING NORTH SLOWLY AND WEAKENING. FORECAST 1002MB
53N 149W. WINDS 35 KT SEAS 22 FT WITHIN 500 NM. WINDS 25 KT SEAS
12 FT ELSEWHERE WITHIN 700 NM.
```

13084.5
0430 5/5
FEC 100/170
NMO USGG HONOLULU

Patrick Sullivan, CA, sent in this High Seas Forecast he copied on RTTY.

Dave Jones

430 Garnor Drive
Suffield, OH 44260

Inauguration of a Column

Welcome to the Federal File, a monthly column encompassing the interesting and ever challenging world of federal monitoring, including military operations. The radio frequency (RF) spectrum offers much to the avid monitor in search of both elusive and routine federal radio operations.

The Federal File will provide coverage of federal and military radio operations "from DC to daylight," with one or two gigahertz being the upper bound, limited to readily-available commercial equipment.

Reader comments and contributions are highly encouraged; in the world of federal monitoring there does not exist a single expert, or a single published source of data that is all encompassing. The best source of data is the collective ability of many monitors channeled through a single source -- the Federal File.

B-O-R-I-N-G ?

Some scanner listeners deem federal monitoring boring; In fact, it is just not as active as the local police or fire department. Also, federal and military frequencies are not as readily available as public safety lists and the local Radio Shack does not have a "federal frequency directory to go." This is discouraging among would-be federal/military monitors.

The goal of this column is to provide accurate and up-to-date listings of active frequencies and associated data to further assist the federal/military monitor and to encourage newcomers to join the ranks.

Tuning in the feds...

Federal monitoring is an art and a science. A key aspect, be it HF or VHF/UHF, is the collection and gathering of data from your individual loggings and the print and news media (commercial radio and television).

Keep a log of your federal monitoring activities; it can take weeks, months or even years to complete the puzzle. In your log place the date, time and other basic facts as well as comments that you may have heard. A lot of buzzwords are utilized by various agencies and organizations. Even if you can not determine the meaning of the phrase now you may be able to at a future date when more data is obtained.

Intelligence Begins at Home!

The print and news media offer invaluable assistance to the monitor and the solution of the puzzle. An individual item may appear insignificant at first, but combined with several other apparently similar pieces the puzzle begins to be solved. A serious federal monitor is a miniature intelligence collection agency.

Information can be obtained from many sources, far more than you'd think. After the local paper and news media stop by the public library. The data than can be found upon searching the card file is amazing. Look up the agency of interest and go from there.

Professional engineering magazines and procurement newspapers abound with data useful to the monitor. In many cases frequencies are listed which are not published on unclassified microfiche cards or in frequency directories.

Commerce Business Daily is one such publication. *CBD* lists most requests from government agencies for procurements and proposals concerning radio systems and subsystems, often including frequencies.

Microwaves and RF is a professional engineering magazine that covers state-of-the-art military and commercial radios and other related subjects. Spend several hours at the local library, main branch preferred, and do some research! It will be time well spent.

A highly recommended aid to all federal monitors is the *Government Master File* microfiche set available from Grove Enterprises. The file set is now five years old; however, I can personally attest to the accuracy as of this date. I have traveled to the corners of the continental U.S. (CONUS) within the last year and the file has proven to have an eighty percent (80%) confirmation rate for both military and non-military operations.

Note that the file does not list most Justice or Treasury Department frequencies (FBI, Secret Service, etc.). The file set does indicate the prime user, such as USAF or USN, and location of transmitter. Emission type (AM, NBFM, etc.) and output power are also listed. The file set does not indicate the actual use of the frequency, but it does cover 9 kHz to over 100 GHz.

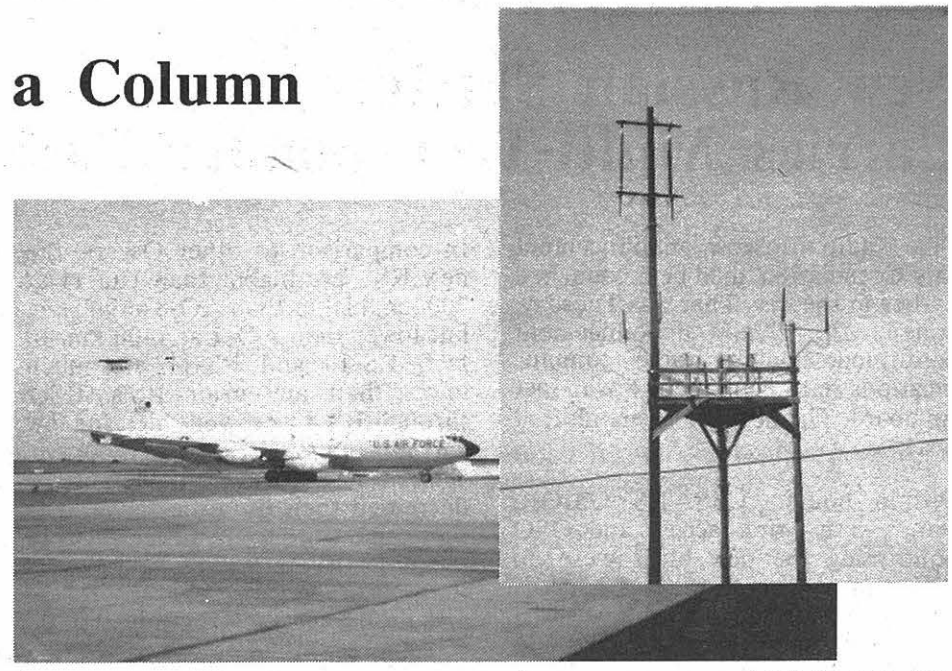
Dayton Data!

The first system profile presented in the Federal File is that of Wright-Patterson AFB (WPAFB) located near Dayton, Ohio. Wright-Pat is the headquarters for the USAF Logistics Command and much engineering is performed at all levels.

All VHF/UHF frequencies listed are NBFM except those between 225-400 MHz, the military aircraft band, which are AM (other exceptions are noted). Updates and corrections are welcomed as this list was confirmed in early 1986.

Coming Up

Request for material for planned columns: Secret Service updates as a major election year occurs in 1988; MAC/SAC/TAC confirmed 225-400 MHz aircraft frequencies, especially nationwide assignments; federal government operations in the 800 MHz land mobile band. Please enclose an SASE if a personal response is desired. Anonymous contributions will not be printed; however, if a contributor wishes not to be identified in print, the request will be honored.



A KC-135 "Strato-tanker" taxies into WPAFB; right, a typical USAF 225-400 MHz communications tower deploying several discones.

Key to Abbreviations

MARS	Military Affiliate Radio System
OSHP	Ohio State Highway Patrol
SATCOM	Satellite Communications
OSI	Office of Special Investigations
TFG	Tactical Fighter Group
AFLC	Air Force Logistics Command
AC	Aircraft
CAP	Civil Air Patrol
ATIS	Automatic Terminal Info Service
ASD	Aeronautical Systems Division

Freq kHz

6776.5	MARS
7541.5	MARS
7800.5	MARS
7832.5	MARS
11547.0	MARS

Freq MHz

44.74	WPAFBOSHP, base only
46.665	IBR Materials Lab
46.95	Acoustical Data Lab
138.025	SATCOM Project 1227
138.075	B/M, user?
138.100	OSI
138.125	906th TFG
138.165	OSI
138.175	OSI
138.250	Instrumentation Maintenance, AM
138.275	906th TFG
138.325	906th TFG
138.375	906th TFG
138.475	AFLC/CC mobile
138.875	APL Fuels, mobile low power
138.900	SATCOM Project 1227
139.250	ABIA, AC-AM
139.650	Energy Control
140.400	Instrumentation Maintenance
140.400	Instrumentation Maintenance
141.525	OSI portables (input to 138.175)
141.700	Timing- IRIG B chan, also AC-AM
141.800	Aircraft AM
142.150	MARS rptr input - primary
142.275	MARS rptr input - secondary
142.300	AFLC/CC
143.450	MARS rptr output - primary
143.750	CAP rptr input - secondary
143.775	MARS rptr output - secondary
143.900	CAP rptr input - primary
143.950	MARS simplex
148.035	Commanders Net AFLC, rptr output
148.150	CAP rptr output & simplex, primary KQD406
148.215	Medical Net
149.205	4950 TW/DOMC
149.200	4950 TW/DOMC
149.225	AFAL Targeting Instrumentation
149.300	Hospital Paging
149.325	ASD Instrumentation, mobile low power
149.535	4950 TW/DOMC
149.550	4950 TW/DOMC
149.925	CAP rptr output - secondary
150.195	AFAL Team Project
150.200	AFWAL Targeting
150.225	AFLC
150.325	2750/XPI Air Terminal operations
155.280	Hospital/Amb Disp
155.325	"
155.340	"
155.805	" (Ohio State CD Net)
163.4625	Structural fire
163.5125	Civil Engineering (CE) F1
163.5625	AFLC
163.5875	Building Maintenance
164.700	Maintenance
165.1125	CE F2
165.1625	MAintenance
165.6125	Maintenance E Net
166.225	Crash/Rescue mobiles (input to 173.5625)
173.4375	Security F1
173.5125	Fire Intercom
173.5375	Security F2
173.5625	Crash/Rescue rptr output
173.6625	Disaster Preparedness
230.400	Flight Test
236.600	Approach control
239.650	SAC
243.000	AF/FAA
251.900	ASD Survival Avionics Test
257.000	AC
259.200	AC
269.900	AF/FAA ATIS
276.800	ASD Survival Avionics Test
280.150	Security Police Duress Alarm
287.200	Flight Test
289.400	Hospital Mobility
289.600	AF/FAA Tower
302.700	ASD
303.700	ASD
311.000	SAC CP - primary, nationwide "Ch 9"
317.900	Flight Test
321.000	SAC CP - secondary, nationwide "Ch 11"
327.100	Approach/departure control
335.300	AF/FAA ground control
341.600	Flight Test
349.600	AC
372.200	AF/FAA, Pilots-to-Dispatch "Ch 19"
379.700	AC
384.400	AC
397.100	AC
407.400	AC- FM, mobile low power
407.500	2046 Deputy Commanders Net Paging
407.700	Research and Design Coordination
407.425	Data Collection
408.050	AFAL Ionospheric Data
408.125	"
408.175	"
409.900	AFLC
413.000	AFAL Ionospheric Data, mobile
413.025	AFLC
413.050	AFAL Ionospheric Data, fixed station
413.100	906th TFG, mobile low power
413.125	AFAL Ionospheric Data
413.150	MAC Radar, mobile low power
413.200	Aero Propulsion Lab, mobile low power
413.275	Motor Pool (maintenance and taxi)
413.375	USAF Museum Net
413.425	AFAPL, mobile
413.450	SAC ALERT frequency, common to ALL SAC locations
All 463.468	Med Channels

Larry Van Horn
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New Russian Satellite Carries Multi-Transponder Packages

The Radio Moscow announcement said Cosmos 1861 had been launched earlier in the day. That was Tuesday, June 23. The announcement confirmed amateur radio communications relay equipment was in fact on board. The new RS's were aloft at last!

Within hours, AMSAT'S G3IOR, Pat, had his first access and QSO confirming the new birds were up and running, but not signing the expected RS-9. These birds surprisingly were signing RS-10 and RS-11 on their telemetry and robot channels.

RS-10 and RS-11 were launched from the Soviet launch site, Plesetsk. The two new Russian "Oscars" were launched from the Soviet Union at 0724 UTC. The launch was letter perfect, placing the RS's and the primary payload, Cosmos 1861, in a 105 minute orbit inclined 83 degrees.

RS-10 and RS-11 share the spacecraft with the primary payload. They share the power and other support from the overall spacecraft system. There is but one spacecraft populated by at least three payloads: RS-10, RS-11 and Cosmos 1861.

The desired orbit was attained very precisely. The nodal period is 105.0245 minutes; the orbital increment is 26.3824 degrees west per orbit. A reference orbit for Sunday, July 5 is 00:14:31 at 61.2 degrees west. Average height is close to 1000 km (612 miles).

In comparison to other Oscars, the new RS's are higher than UO-11 at 700 km, higher than AO-8 at 900 km, but lower than AO-7 at 1400 km. In fact, RS-10 and RS-11 are much lower than any prior RS's. RS-1 through RS-8 were very high for low earth orbiters (LEO) at 1700 km. This may have substantially decreased their life expectancy since they came close to the lower edges of the Van Allen Radiation Belts at that altitude. Prospects are RS-10 and RS-11 will perform much longer at 1000 km. Moreover, their altitude assures they will maintain stable orbits for several decades at least.

NORAD has designated Cosmos 1861 (and its parasites RS-10 and RS-11) Object 18129. Its international designation is 87-54A.

Here is a recent element set for the satellite:

Element set: 20
Ref. Epoch: 87 186.48411794
Inclination: 82.9260
RAAN: 44.5413
Eccentricity: 0.0009224
Argument of perigee: 231.8894
Mean anomaly: 128.1418
Mean motion: 13.71882498
Decay rate: 6.0E-08
Rev. #: 167

RS-10 and 11 were built at the Tsiolkovskiy Museum for the History of Cosmonautics in Kuluga, an industrial center 180 km southwest of Moscow. The chief architects of the transponders, called BRTK-10, were Aleksandr Papkov and Viktor Samkov. BRTK stands for the Russian equivalent of "Equipment for Radio Amateur Satellite Communication." The overall project management is in the hands of DOSAAF, a military related organization whose major mission is the training of pre-draft-age youth in military significant technology.

RS-10 and RS-11 are, according to current information, identical except with regard to frequency. Each apparently uses three bands in various combinations to achieve five distinct modes of operation in addition to its auxiliary robot repeaters. On each unit, 15 meters is used exclusively as an uplink band, 10 meters is used exclusively as a downlink band as 2 meters can be employed either as uplink or downlink band. Specifically:

Mode K - 15m up & 10m down.
Mode T - 15m up & 2m down.
Mode A - 2m up & 10m down.
Mode KT - 15m up & both 10 & 2m down.
Mode KA - both 15 & 2m up & 10m down.

The new modes KT and KA are simply combinations of Modes K and T and A. Beacons can carry telemetry or robot downlink (See Table I).

Please turn to page 61

TABLE I
RS Frequencies

Radio Sputnik 10

Mode A:	145.860-145.900 MHz up yields 29.360-29.400 MHz down. Beacons--29.357/29.403 MHz.
Robot A:	145.820 up yields 29.357 or 29.403 MHz.
Mode K:	21.160-21.200 MHz up yields 29.360-29.400 MHz down. Beacons--29.357/29.403 MHz.
Robot K:	21.120 MHz? up yields 29.403 MHz.
Mode T:	21.160-21.200 up yields 145.860-145.900 MHz. Beacons--145.857/145.903 MHz.
Robot T:	21.120 MHz? up yields 145.857 or 145.903 MHz down.
Mode KT:	21.160-21.200 up yields 29.360-29.400 and 145.860-145.900 MHz. Beacons--29.357/29.403/145.857/145.903 MHz.
Mode KA:	21.160-21.200 and 145.860-145.900 up yields 29.360-29.400 MHz down. Beacons--29.357/29.403 MHz.

Radio Sputnik 11

Mode A:	145.910-145.950 MHz up yields 29.410-29.450 MHz. Beacons--29.403.29.453 MHz.
Robot A:	145.830 MHz up yields 29.407 or 29.453 MHz down.
Mode K:	21.210-21.250 up yields 29.410-29.450 MHz down. Beacons--29.403/29.453 MHz.
Robot K:	21.130 MHz up yields 29.403 or 29.453 down.
Mode T:	21.210-21.250 up yields 145.910-145.950 MHz down. Beacons--145.907/145.953 MHz.
Robot T:	21.130 MHz up yields 145.907 or 145.953 MHz down.
Mode KT:	21.210-21.250 up yields 29.410-29.450 and 145.910-145.950 MHz down. Beacons--29.407/29.453/145.907/145.953 MHz.
Mode KA:	21.210-21.250 and 145.910-145.950 up yields 29.410-29.450 MHz down. Beacons--29.407/29.453 MHz.

TABLE II
Telemetry

In the table below, the alpha part of a channel is designated by "A" and the numeric part by "N" as in channel "1A" and "1N".

Channel Number	Status Designators	Meaning/Equations
1A	IS	Telemetry data source sampling period 90 minutes or
	NS	Telemetry data source sampling period 10 minutes
1N		Power supply voltage over sample period where v = N/4 volts.
2A	IR	2 meter receiver with -20 DB attenuator in or
	NR	2 meter receiver with -20 DB attenuator out
2N		Output power of 2 meter transmitter where w = N/10 in watts.
3A	ID	15 meter receiver with -10 DB attenuator in or
	ND	15 meter receiver with -10 DB attenuator out
3N		Output power of 10 meter transmitter where w = N/10 watts.
4A	IG	15 meter uplink off or
	NG	15 meter uplink on
4N		15 meter receiver AGC voltage where v = N/5 in volts.
5A	IU	2 meter receivers off or
	NU	2 meter receiver on
5N		2 meter receiver AGC voltage where v = N/5 in volts.
6A	IW	special command station channel off or
	NW	special command station channel on
6N		Special command station AGC voltage where v = N/5 volts.
7A	IK	output power of 10 meter beacon = 1 watt or
	NK	output power of 10 meter beacon = 300 milliwatts
7N		Service command, parameter, 10 meter mode.
8A	IO	output power of 2 meter beacon = 1 watt or
	NO	output power of 2 meter beacon = 300 milliwatts
8N		Service command, parameter, 2 meter mode.
9A	AS	status of 1st memory board = off or
	MR	status of 2nd memory board = on
9N		10 meter transmitter temperature where t = N - 10 in degrees C
10A	AR	status of 2nd memory board = off
	MR	status of 2nd memory board = on
10N		2 meter transmitter temperature where t = N - 10 in degrees C
11A	AD	special service channel for loading memory is open or
	MD	special service channel for loading memory is closed
11N		20 volt power supply temperature where t = N - 10 in degrees C
12A	AG	code store memory status is open or
	MG	code store memory status is closed
12N		9 volt power supply temperature where t = N - 10 in degrees C
13A	AU	output information from memory via 10 meter beacon of
	MU	output information from memory via 2 meter beacon
13N		control parameter backup 9 v power supply where v = N/5 volts
14A	AW	attenuator of 15 meter robot receiver = -10 DB or
	MW	attenuator of 15 meter robot receiver = 0 DB
14N		If voltage of 15 meter robot receiver v = N/5 in volts
15A	AK	attenuator of 2 meter robot receiver = -10 DB or
	MK	attenuator of 2 meter robot receiver = 0 DB
15N		if voltage of 2 meter robot receiver where v = N/5 in volts
16A	AO	special command channel 2 meter output power = 1 watt or
	MO	special command channel 2 meter output power = 300 milliwatts
16N		robot QSO counter where 00-32 QSOS logged is indicated as 00 and 33--128 QSOS indicates in the range of 80-99

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Scanning Philadelphia's Constitutional Celebration

On September 17th, 1987, the President, members of Congress and other dignitaries will converge on Philadelphia to celebrate the 200th anniversary of the Constitution. Philadelphia is the fifth largest city in the country, with an estimated population of 1.6 million. The surrounding population is about four million. Imagine scanning the action when more than five million people decide to have a party!

When monitoring a national event, the fun, excitement and extraordinary amount of radio traffic can be overwhelming. A scanner in the hands of a novice will miss more than half the action. Here's how to monitor a major event with professional results.

Begin by asking yourself the following questions. "Who is visiting?" If it is the President, then Secret Service frequencies will be needed. Next, ask yourself, "When and where will the event take place?" Is it in center city? At the water front? In a state park? The frequency coverage will differ with each location.

Lastly, ask, "What if?" What if an unidentified subject appears on a roof top? Rapid response team, SWAT and hospital frequencies may be needed. In brief, when the action gets hectic, there won't be time to research frequencies!

Thinking Ahead

Obtaining information on scheduled events can be simplified by a visit to the area's visitor information center. A wide variety of maps and pamphlets will be provided free for the asking. If a toll-free number is available, check the phone information against published listings for any last-minute changes.

Many activities will be scheduled before and after the feature attraction; neglecting these "smaller" gatherings will prevent you from hearing all the action. For example, if a balloon race is scheduled, call the sponsoring club and ask for specific frequencies that can be monitored. As a last resort, search the frequencies between 151 and 152 MHz for balloon traffic.

Fireworks that are near a large airport cause concern for air traffic. If the fireworks are held over a river, the Coast Guard and Marine Police will be needed to stop river traffic. Should a fire start, both fire boats and land equipment will become active.

Parades and crowd control in a large city are usually handled by a special task force that operates on its own separate frequency. In Philadelphia, this operation is code-named "M band." It operates on 453.55 MHz. During a recent visit by Vice President Bush to Philadelphia, the "M band" was occupied by SWAT, FBI, Secret Service and Rapid Response Teams. If your area has designated channels for emergency use, check them out!

Public transportation will be operating at full capacity. Any type of equipment breakdown or schedule change will produce unwanted delays that have the potential to quickly grow into monumental problems. Have the security frequencies for trains and buses on hand.

Philadelphia has the unique advantage of being located within a 50-mile radius of two other coastal states: Delaware and New Jersey; this region is often referred to as the "Tri-State Area." It is recommended that scanner enthusiasts in similar regions have the emergency medical frequencies for adjoining states. In an emergency, many hospitals within a "tri-state area" may come into service.

News media coverage of major events can also provide plenty of scanning action. Look for the technical crew frequencies. These crews will be providing "live" coverage of important news stories. When prime locations for filming are limited, film crews will often ignore both police and air traffic boundaries. It is not uncommon to hear a news chopper pilot being "chewed out" by an air traffic controller!

Major highways in the Philadelphia area are patrolled by the state police whose coordination with city police can be monitored on 154.755 MHz. Pennsylvania state police helicopters and aircraft also operate on this frequency.

Other related areas that may also be of interest include traffic reporters, institutes, museums, colleges and universities, hotels, and inns. By now, you're probably saying, "How can I listen to all of this at one time?" How? By training your ear to listen to at least three or four scanners at one time! At first, this may seem confusing; however, it's simply a matter of ignoring what isn't important.

One method that works is to adjust each radio's volume in relation to priority. If the President is landing at the airport, then the volume on that particular scanner should be raised slightly above the others. You can still hear the city police, airport security and hospital frequencies. Unless your ear detects something unusual, keep your attention focused on the President. Working the traffic in this manner allows for maximum coverage.

Use your scanner's features to your advantage. Don't program the delay feature into all the channels. This is especially true if you are using multiple scanners. Having the scan delay on every busy channel will slow things down unnecessarily. Without the delay, a large amount of routine traffic can be quickly sampled. If the action starts to get hot, simply stop the scan or add the delay function to those channels that are beginning to perk.

The priority channel feature should also be given careful consideration. If the channel isn't truly one that must be heard above all others, then don't use the priority mode! Unnecessary priority channels can actually make you miss more action than you will hear!

Generally, a quick, random sampling of 160 channels on four scanners will provide plenty of action. If this sounds hectic, you're right; it is! But that's the way it should be.

To fully enjoy the thrill of scanning major event, don't sit down at t dials with a beer and sandwich. Whe the action starts, you should b busier than an air traffic controlle Notes and frequency lists will nee constant attention. As the actio shifts, frequency banks will need t be added or subtracted. You ma even want to have a fifth radi searching for *new* frequencies!

If there is an all-news AM station i your area, have it on, too! If you hea the action before the radio statio broadcasts it as a "news flash congratulations! That's profession scanning!

Scanning a major event such Philadelphia's 200th Constitution Celebration can be informativ exciting and intriguing. Do you homework, use a little common sens and don't forget to make a tape o the action. It will become a perma nent souvenir of your efforts.

PHILADELPHIA POLICE

A Band	453.350	Q Band	Not in use
B Band	453.650	R Band	Not in use
C Band	453.150	S Band	Not in use
D Band	453.2	T Band	453.250
E Band	453.3	U Band	453.6
F Band	453.950	V-Z Bands	Not in use
G Band	453.800		
H Band	453.4	Surveillance	154.770
I Band	Not in use		154.890
J Band	453.750		154.650
K Band	Not in use		155.250
L Band	Not in use	City Ops	453.725
M Band	453.55	Phila Airport Police	453.450
N Band	Not in use	Airport Ops	453.850
O Band	Not in use		
P Band	453.5		

PHILA FIRE DEPT

F-1	154.235
F-2	153.950
F-3	154.145
F-4	153.830
F-5	153.935
F-6	154.965

TRI-STATE AREA MEDICAL

Philadelphia:

Rescue	170.150
Paramedics to hospitals	463.00
	47.54
	155.34

New Jersey:

Mutual aid	154.265
	156.210
Med Dispatch	154.430
Medevac	155.220

Delaware:

Ambulance	155.2050

PA STATE POLICE
(Phila. area)

Chan B	155.670
Air & Radar	154.755
Phila SP base & mobiles	155.580

MARINE TRAFFIC

Phila Naval Yard	
Marine Police	160.3750
Coast Guard	157.1
Distress Calls	156.8

INDEPENDENCE NATL PARK

Park rangers	164.725
City police	453.150

PUBLIC TRANSIT SECURITY

SEPTA Security	502.6875
	502.7625
	502.7125
Emergencies	502.7375

SECRET SERVICE
(As monitored in Phila)

164.65	166.640	167.025
165.375	166.510	169.625
165.785	166.610	169.925
166.4625	166.7	

PHILA INTERNATIONAL

Tower	118.5
Approach Ctrl	119.0
	125.4
	126.6
Departure	124.35
	119.75
Ground Traffic	121.9
Emergency	121.5

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The History Continues .. and Ends!

- The 1960s, '70s & '80s

Solid State Arrives

Last month we beat down TVI, saw SSB grow like a weed, got back into the saddle again after surviving World War II, started the trend toward buying instead of building, and saw the future of electronics in the arrival of semiconductors.

The future was really brought home to amateurs when OSCAR 1 (Orbital Satellite Carrying Amateur Radio No.1) was launched on December 12, 1961. A great achievement in the history of amateur radio. And another nail in the coffin for the tube, except as a high power amplifier.

The VHF/UHF regions of spectrum continued to grow in use during the '60s. By 1960, phone use was about 50% AM and 50% SSB, with the exception of 20 meters which was about 70% SSB. By 1970, AM was only a few percent anywhere.

The '60s and '70s saw amateur radio equipment get smaller and smaller with more and more bells and whistles as solid state design advanced. And along with ICs (Integrated Circuits) and microprocessors, two significant advances were PLL (Phase Locked Loop) tuning and digital displays.

The newfound frequency accuracy and capabilities in the typical transceiver made the earlier equipment look crude by comparison. However, even though they might have been crude, in the hands of a competent operator, that earlier equipment performed beautifully.

Change for the Worse

All the technical marvels of that age, however, could not save amateur radio from itself. In a move which was at best a grave error, and at worst, stupid arrogance, the ARRL board voted to push for a plan known as incentive licensing. They did that, the FCC did it, and amateur radio hasn't yet recovered from it to this day!

After 20 years of growth wherein the numbers doubled three times during the period 1947 to 167, growth slowed such that we haven't even doubled one in the 20 years since! The reason was simple. Instead of grandfathering the then current licensees who already had certain phone and other privileges, they took them away!!

Even then, with electronic RTTY and other digital improvements in place and on the way, all the oldtimers still wanted CW to be the measure of a persons suitability to be a ham. After all their arguments went, "I had to do it, so why not you?!" Staggering logic, that!

As we have seen in this history, hamming is a social hobby. It's very hard for only one to play. And while many U.S. hams are comfortable with CW as a mode of communication and even like or prefer it (and the author of this column is one of that group!), most hams are not comfortable with it!

Most hams want to talk with their mouths, into a microphone, not with their fingers, on a key! And a lot of all their hard won privileges were taken away from them. They did the natural thing. They quit! And found a hobby not controlled by a clique of old men in Hartford.

Amateur radio never recovered. The timing was horrible for several reasons, and the manufacturers in Japan (who have more hams than the rest of the world combined!) took full advantage of the fact that American manufactures had less people to sell to and price cut most of them right out of business.

Novice Enhancement might just turn the situation around if we can show the computer whizkids of today how they can put their computers on the air and talk with them too! A VHF/UHF digital class no code license would also help. But we shouldn't hold our breath waiting for that.

Thanks mainly to the actions of the late Vic Clark, immediate past president of ARRL, and a few others, a lot of progressive changes have been made at ARRL in recent years. They still have a long way to go, but they need your help to do it.

So join them. You get lots of great benefits including a fine monthly magazine (ARRL; 225 Main Street, Newington, CT 06111; $25.00 a year - and well worth it. And be sure to tell them that the club code number for your initial membership is 1877.) Help to complete Vic Clark's work for progressive change in the ARRL.

The growth of repeaters and quality built, small hand-helds really helped the emergency and public service support capability of hams. AREC and RACES provide improved service to the public in general as well as to the Red Cross.

The '80s has brought us digital and solid state capabilities we never dreamed of even 15 years ago. Error free RTTY (but you still have to spell it wright er . . . write uh . . .that is correctly!), packet, miniaturization, and much more to come. I don't know about you, but I can hardly wait.

The End

Well that's it! 100 years of amateur radio. "100 years?," you ask. Certainly. You don't think Heinrich Hertz was a professional do you? He was just an amateur experimenter like the rest of us when he first propagated electromagnetic waves through space in 1886. And while Marconi turned professional in 1898 or so, up till then he too was an amateur.

So it can honestly be said that when I began this ham history a year ago in the October 1986 *MT*, it was to celebrate the first 100 years of amateur radio. And that's why I did it!

I know that I sort of eased over the last 27 years or so in this months installment, but writing recent history which one has lived through (I was first licensed in 1954) and has emotional attachment to is very hard to do objectively. And as I see it, the solid state and digital (plus microprocessor) revolution plus the incentive licensing debacle are the big happenings of the period.

I have received letters about the history which said "Who needs it!," and letters which said "It's great!" (one of the latter from the editor of a major ham magazine!). At least it's a dialog, and we certainly need all of that we can get.

Besides, if you don't read and learn history, you are condemned to repeat it! And this great hobby can not afford another 1967 type error. If you have any comments on this history, be sure to write me. I'm as close as your mailbox!

Next Month: More room to write about the main subject of each column, to report current events in hamming, and to print and discuss your letters!!

CONTESTING - Games Hams Play

If you have ever seen the commodities trading area (the pit) on TV, you have seen an example of a ham contest. A lot of people stand around quietly until the bell rings to indicate start time. Then they start all shouting at each other all at once in total bedlam, all the while noting the contacts they have made and the info regarding them on a log they carry in their hands. And when the bell rings again to indicate the time is up they settle down to tote up their counts for the day.

No joke. It's just like that for many contests. There is a start time. At that time, the bands come alive with "CQ Contest" transmissions. Contacts are made with a quick standard reports and noted on paper then on to the next one. When it's over, the participants review their logs and tally up the points. The logs are sent into the contest sponsors where they are graded, and a report of winners appears in one or more of the ham magazines.

Now so far this sounds like a totally zany and confusing way to spend time. One might also expect that it takes little talent or brains to compete in such contests. Both perceptions are totally wrong!

Almost all contests have well worked out rules and procedures which somewhat control and limit the actions of participants. And those who win are those who plan ahead, use all their skills to the utmost, and develop and carry out practices which increase efficiency, contact rates, etc.

It's a lot of fun, but it's also a lot of work if you want to be a winner. So why do it? Because it is fun and a challenge too!

DXing and contesting (in all its forms) are the two most popular forms of hamming after rag chewing. And not all contesting is like what I have described above, although it is a common form for the big national and international contests.

Fresh Wallpaper Anyone?

Some contesting consists of certificate (or awards, as some of the certificates are called) gathering. DX Century Club, Worked All States, Worked All Continents, Worked All

Zones, are some of the top level certificates.

Worked All Reardon Township Hams, Worked 10 King County Hams, Worked All Districts Of Zurich Canton, etc. are typical of the smaller level certificates.

There are those who quite literally have their ham shacks papered with such certificates. And some of the smaller level (less prestigious) certificates are actually the hardest to get.

The number of possible certificates is staggering. Some ham magazines have had columns running for years just reporting on the 10 to 15 new certificates available each month.

Certificate hunting is sort of like collecting oversized stamps. There's a lot of them, and you know that you will never get them all, but you keep trying, and occasionally get a rare (hard) one.

Most hams do it in one form or another. Check it out. Read up on it in the back issues of your ham magazines. You too may soon be repapering the wall of your shack

But getting back to the type of contests we first mentioned, let's see how you can join in the fun. To be a success in contesting you have to learn to listen well, develop winning strategies, and work hard, long hours. You will also have to deal with the terms "Big Guns," "Medium Guns," and "Little Guns."

To give you a feel for those terms, a Big Gun would have 1500 watts on all bands feeding several rhombics or beams. A Medium Gun might have a single multiband beam and an amplifier. A Little Gun typically has just the transceiver (100 watts) and a vertical, a dipole or the like.

Have Brains, Will Contest

But that's just the equipment. Brains most often make the real difference. Smart operators with Big Gun brains can do very well with a Little Gun station!

And speaking of brains, let's get one thing straight. There is no one best way which works for everyone. You have to develop your own style and do what you are comfortable with. Trying to exactly copy someone else's style is a mistake. Learn what has to be done and work out how to do it in a manner that works . . . for you!

OK. Now that we have that straight, let's contest. The first few times you do it, don't worry about winning. Worry about learning, and getting practice in doing it right.

Use those first few contests to improve your capabilities and get the station layout right. Practice is very important in finding out what does work for you.

Your goal in all your practice is to speed up your contacts so you get as many per hour of activity as possible. This doesn't mean just talking faster. It means you are on the right bands at the right times. It means using the minimum of moves to make and log your contacts. It means listening, really listening to pull in those important contacts out of the QRM.

Practice also means getting comfortable with the standard exchange for the particular contest so you do it fast and clear. It means knowing when and where to call CQ. It also means knowing when to search and how to analyze who is able to talk to whom for current band propagation info.

Another thing practice and study means is thoroughly understanding the multiplier factors for a contest (most contests have them). It can make a big difference in who you talk to when there are choices. And in most large contests there will be choices.

About now you are saying "This is crazy. Who needs this hassle? To hell with contesting. I'm going to chew the rag with Charlie (or whomever!)." Sorry about that, but that's definitely the wrong response. I am only trying to show you that contesting is not a simple, worthless endeavor. Contesting takes real talent and practice.

The Challenge

Contesting is a real challenge. So if your mind is up to it and you're willing to put in some time, it could be just the challenge for you. The feeling of achievement you get when you do well in a contest is just fantastic. But when your call and point totals show you to be a winner for your area, section, country, or overall class, now *that's fantastic!!*

So start reading the back issues of your ham magazines, the *ARRL Operating Manual* and *Radiosporting* Magazine (a magazine that thoroughly covers contesting and low band challenges very well - P. O. Box 282, Pine Brook, NJ 07058, $18.00 per year - tell them you read about it in *MT*).

Also be sure to get a copy of *The Contesting Cookbook* by Bill Zachary, N6OP, and his many contest winning friends (*73* Magazine, WGE Center, Peterborough, NH 03458, ATTN: Uncle Wayne [honest!!] - $6.95 including postage and handling). It's a great book with hints on everything you need to know plus lots of good advice, but it's almost out of print, so hurry. And be sure to tell them you heard about it in *MT* too.

Next Month: Morse Code and CW - It'll Be Dahdahdit Didahdit Dit Didah Dah!

BITS AND PIECES

Now that the history is over, there is more room for current (recent) events and activity. I ha mentioned before that this is yc column too and have always enco aged you to write. Send in yc questions and suggestions subjects to be covered or things y would like to read about. I will to get them covered for you. T column will always be better if contains dialog rather than monol

Also if you have info you would l to have appear in the column, sen in. No absolute promises, but i looks OK it will be here.

Keep those cards and letters comi Write today.

Please turn to Page 60 f the October Convention Calendar

Some Additions and Changes

Logged in June
by Fred Hetherington
Ormond Beach, FL

6358.3	Y5M Ruegen	50/170r Summary, GG, of GDR ship info. 0150. New here.
8908.3	? ?	ARQ idling 2330-0000. Can you identify? New here.
10953.7	FDX Paris	T425 (PQA/PQB) RFFP to FGQPCS, Djibouti//FDX Paris 13649.5, same msg at same time, 0045.
11420.1	Y2V59 Berlin	50/425n ADN Nx SS 0040. New Nx pgm, new time.
11628.1	CLP-1 Habana	45/425r ry and zzzzz then SS to Embacuba. 0149. New.
12110.1	LZC-3? Sofia	75/425n Bulgarian Nx to embassies, 2130, then to embassy "PMO" at 2152 and to CW. Off 2155. New here.
13449.3 or	9RB334 Bukavu VHC Canberra?	T350, Chan A&B idle 1200 to 1240 when left the air. Both of these stations are register with ITU for multi-channel service on this freq.
13465.3	CT-(RPFN) Monsanto	50/850r ry, fox count, test. New channel 0115.
13674.3	N?? US Navy	75/850r...very quick brown fox...1550. New channel
14764.0	A9M70Manama	75/350r GNA (TB) Nx AA 1716, still on at 1950
14800.6	Y2V24A Berlin	50/400n ADN Nx PP has been added, 1810.
15710.1	RED-52 USSR	50/425r TASS & ADN Nx FF 1530-1830, then ry REM-56 RBX-42 RIC-71 RED-52 1830. Another day, RWN-76 Moscow, this frequency also, TASS Nx FF at 1855 then ry saying // RGW-26 and RIC-71 (16190 and 14940). RED-52 probably not in Moscow. Where?
15776.3	ZRH93 Cape Town	75/850r fox jumps (note present tense) 1240. Later in day he usually contacts NMN and NAU.
15780.1	RWM-71 Moscow	50/425r TASS Nx EE on later now. 1510.
15925.1	RPT-32 Tachkent	50/425r ry and signing as a single at 1040 tune-in. Lining up for TASS Nx broadcast at 1100.
15977.1	FPP97G Paris	50/425n ry QRA de FPN-72/H3 FTJ-39A/G, 1800. He suddenly realized FPP97G was on, too, and pulled 15977 off at 1800, before starting Nx on 13729.7 and 9396.4.
16010.0	CLP-8 Conakry	50/510n very urgent code group msg to CLP-1 Havana, from CLP-4 Bissau, 1240 - then African Nx SS for Minrex, Havana
16039-42.2	MKK London	VFCT System, channels, 50/170, now more channels added (formerly 16039-41). All ryi fox at 0030.
16045.5	CLP-1 Habana	50/425n Circular, SS, to Embacubas (Cuban Nx) 1805. New channel - one of many many new channels.
16075.1	RNN?RMS49? Moscow?	75/425r TASS Nx EE 1040. At 1055 APN USSR Sports Nx in EE! At 1120 Nx RR then tgm from Konec. New.
16112.1		50/210r encryption 0000-0100. Can you help? New.
16120.2	? ?	ARQ-425 shift! His pal is on 16150, also ARQ-425 shift. Off 1430. On again, off 2052 without giving callsign or location. Here the stronger is 16150.
16153.0	AIE?AGB4?	VFCT top chan at 16153.0 50/85r, AP & UPI Nx EE for AFRTS Stns abroad. Tune-in 0000. Still on 16040.
16200.4	? ?	75/525n 5L cd grp msgs - each headed by "No.--, EKSTENA." Sign off 0000 with EE ok tks om ge sk. Very strong here - Like Wash.DC or Ottawa. Can you help?
16249.9	RME22 Moscow	100/425r TASS Nx EE 0935. Msg RR signed "Konec at 0943." New here. Nx EE continued after msg.
16356.7	Y??? Berlin	50/300n cd grp msgs, then at 2000 went to 100/300n and MFA (Folgt) Nx GG. New here. See next item.
16356.9	Y??? Berlin	50/425n MFA Nx GG to Embassies. New here. Y7A67 is registered with ITU for use on 16358.0. Y7A66 used to be on 16352.
16397.6	FTQ39 Paris	Diplo Nx SS now at 2300. Update records.
17549.9	9HA(LMMM) Malta	50/375r ry meteo 1719. New channel
17570.0	RBX-42 Tachkent?	50/425r ry at 1540//RGW-26 REM-57 RED-52. New callsign, maybe new station.
17599.1	? ?	75/425r code groups, very interesting, SK and off at 1330. About same time daily.
17442.2	Y7K37 Berlin	50/425n Code groups msgs to GG Embassies then Diplo Nx (Folgt) GG. Says 2nd run. 1230. At 1250 ry // Y7A37, 49 and 57. New channel here.
18047.1	YZ--(DFZG) Belgrade	75/425n msgs to Yugoslav Embassies 25 & 26 at 1445. Off 1456. New freq. Moved from 18042 to 18045, now moved here.
18502.3	FUB RFFIV Paris	T850B Now using Circuit Indicator "ILA" for msgs FF to FUF RFLIA Ft. de France. 2340. Why do C.I.s keep changing?

RTTY and a Little More

Contributed by David E. Alpert
New York, NY
ICOM R71A, Drake SPR-4, Random wire
Kantronics Field Day RTTY unit

4020	LSB	USA	WAR, Ft. Meade, MD. Armed Forces Day x-band operations. Op John, listening on 3950. 0140, 17 May
4024	LSB	USA	AIR, Andrews AFB, MD. Calling CQ Armed Forces Day. Listening on 3965. 0145, 17 May
6251	RTTY	Unid	RYRYRY 95XRA DE 980QJ. 100wpm. 0430, 12 May
6683	LSB	Canada	SAM 24127 wrking Andrews AFB. Called this channel "65 Lower." Also hrd this plane wrking ATC on 8864. 0200, 13 May.
6745	USB	Unid	Phonetic alphabet station, YL voice. Off at 0353, 12 May
6941	RTTY	Greece	USIA EE nx "Europe File." 100 wpm. 0245, 13 May
6986	RTTY	GDR?	Apparent Embassy comms. 66wpm. Some sort of press summary in GG; mentions of TASS, NY Times, NATO, SDI, etc. 0315. Into hand-keyed CW 0331, bk to RTTY 0333, 12 May
6999	RTTY	USA	AAA5A 66 wpm w- "msg to all stations." Much CW QRM. MARS station. 0150, 13 May
9765	USB	UK	Portishead Radio w/tfc list overriding NMN wx bcst.0400, 12 May
9070	RTTY	Senegal	6VU testing w/RYRYRY 66 wpm 0130 11 May
9994	RTTY	Azores	Santa Maria Aero, 66 wpm. Aircraft position rpts and wx info. Each msg began w/prefix "MCA," i.e. MCA024, MCA025, etc. 0115 17 May.
9996	AM	USSR	RWN, Moscow. Time signals. Long pip at :00, doubler pips at :09, :10, :11, :31 & :32 past each minute. 0410, 12 May.
10235	RTTY	Sudan	STK, Khartoum. 66wpm RY tape. QRM VOA feeder. 0345 12 May
10536	RTTY	Canada	CFH, Halifax. 100wpm plaintext wx 1850, into FAX 1900 10 May.
10971	RTTY	Morocco	USIA, Tangier. 100wpm EE nx "Europe file." 0030 9 May.
12312	RTTY	France	66wpm wx info in FF. 0119 9 May.
13244	USB	USA	MacDill AFB in comms w/MAC05221. Fonepatch for wx. 2008, 10 May.
14408	USB	USA	AIR, Andrews AFB, MD. Armed Forces Day "listening on 14310." 0055, 17 May
14445	USB	Unid	VXV9 calling CIW660 & "Charlie India X-Ray 6-6-0 calling Victor X-Ray Victor Niner." Both well hrd. "Any other CFARS stations wishing to join the net call VXV9." Grove SW Directory and the CFL both list VXV9 as in Golan Heights, Syria. 2300 16 May.
14780	RTTY	Egypt	SUC. RYRYRY DE SUC. 66wpm. 0130 11 May.
14819	USB	USA	NN0PPE, Vienna, VA, wrking "Charlie Romeo Gulf" s/Mothers Day fone patches. CRG on US ship "Stump"?? 2235, 10 May. Other Mom's Day MARS patches hrd on 14447 & 14467.
14901	RTTY	Cuba	TASS relay. 66 wpm EE nx. 1732 9 May
17143	CW	GFR	DAN. CQ marker, 2030 10 May
17217	CW	Holland	PCH. Marker 2022 10 May

frequency SECTION

The MT Monitoring Team

Joe Hanlon, PA

Rich Foerster, NE

Greg Jordan, NC

LEGEND:

* The first four digits of an entry are the broadcast start time in UTC.
* The second four digits represent the end time.
* In the space between the end time and the station name is the broadcast schedule.

S=Sunday M=Monday T=Tuesday W=Wednesday
H=Thursday F=Friday A=Saturday

If there is no entry, the broadcasts are heard daily. If, for example, there is an entry of "M," the broadcast would be heard only on Mondays. An entry of "M,W,F" would mean Mondays, Wednesdays and Fridays only. "M-F" would mean Mondays through Fridays. "TEN" indicates a tentative schedule and "TES" a test transmission.

* The last entry on a line is the frequency. Codes here include "SSB" which indicates a Single Sideband transmission, and "v" for a frequency that varies.
* Frequencies in bold are most likely to be heard regularly in North America.

We suggest that you begin with the lower frequencies that a station is broadcasting on and work your way up the dial. Remember that there is no guarantee that a station will be audible on any given day. Reception conditions can change rapidly, though, and if it is not audible one night, it may well be on another.

0000 UTC [8:00 PM EDT/5:00 PM PDT]

0000-0015	Voice of People of Kampuchea	9693, 11938
0000-0025	Kol Israel	**9435, 9855 11610**
0000-0030	BBC, England	**5975, 6005 6120, 6175 7325, 9410 9515, 9590 9915, 12095 17710**
0000-0030	Radio Berlin International..	**6080, 9730**
0000-0030	Radio Canada International..	**5960, 9755**
0000-0030 M	Radio Norway International..	**9610**
0000-0045	WYFR, Florida	**9680, 11855**
0000-0050	Radio Pyongyang,North Korea	15140, 15160
0000-0100	Armed Forces Radio and TV..	**6030, 15345**
0000-0100	All India Radio	9910, 11715
0000-0100	CBC Northern Quebec Svce....	**6195, 9625**
0000-0100	CFCX, Montreal, Canada	6005
0000-0100	CFRX, Toronto, Canada	6070
0000-0100	CFVP, Calgary, Canada	6030
0000-0100	CHNX, Halifax, Canada	6130
0000-0100	CKFX, Vancouver, Canada	6080
0000-0100	KCBI, Texas	11910
0000-0100	KSDA, Guam (AWR)	15115
0000-0100	KVOH, California	**17775**
0000-0100	KYOI, Saipan	15405
0000-0100	Radio Australia	**15160, 15320 15395, 15140 17750, 17795**
0000-0100	Radio Baghdad, Iraq	**11705**
0000-0100	Radio Beijing,China	9550
0000-0100	Radio Discovery,Domin. Rep.	15045
0000-0100v	Radio Dublin International..	6910
0000-0100	Radio Havana Cuba	**6090, 9655**
0000-0100	Radio Moscow	**9530, 9600 9685, 9720 9765, 9865 9880, 11710 11750, 12060 15425**
0000-0100	Radio Moscow World Serv....	**11845, 12000 17675, 17850 17860, 17880**
0000-0100	Radio Thailand	9650, 9665 11905
0000-0100	Radio Veritas, Philippines..	9740
0000-0100	Radio New Zealand Int'l....	11780, 15150 17705
0000-0100	RTL Luxembourg	**6090**
0000-0100	Spanish Foreign Radio, Spain	**9630, 11880**
0000-0100	Voice of America	**5995, 6130, 9455** 9650, **9775 9815, 11580 11695, 11740 15205**
0000-0100v	Voice of Nicaragua	6015
0000-0100	WCSN, Boston, MA	**11980**
0000-0100	WINB, Pennsylvania	15145
0000-0100	WHRI, Indiana	**11770**
0000-0100	WRNO Worldwide	**7355**
0015-0100	AWR, Costa Rica	15460
0030-0100	BBC, England	**5975, 6005** 6075, **6120 6175, 7325** 9515, **9590 9915**
0030-0100	HCJB, Ecuador	**9870, 11775 11910, 15155**
0030-0100	Radio Belize	3285
0030-0100 W,A	Radio Budapest Hungary	9835, **11910**
0030-0100 S,M	Radio Canada International	**5960, 9755**
0030-0100 T-A	Radio Portugal	**9680**
0030-0100	SLBC, Sri Lanka	6005, 9720 15425
0045-0100 M	Radio Cultural, Guatemala...	3300, 5955
0045-0100	Radio Korea World News Svc..	7275
0050-0100	Vatican Radio	**6030, 9645 11780**

0100 UTC [9:00 PM EDT/6:00 PM PDT]

0100-0115	All India Radio	6035, 7215 9595
0100-0115	Vatican Radio	6030, **9605** 11780
0100-0120	RAI, Italy	9575, **11800**
0100-0124	Kol Israel	**9435, 9855 11610**
0100-0130	HCJB, Ecuador	**9870, 11775 11910, 15155**
0100-0130 T-A	Radio Budapest, Hungary....	**6025, 9520 9835, 11910**
0100-0130	Radio Japan General Service	15280, 17845
0100-0130	Radio Vientiane, Laos	7112v
0100-0130	WINB, Pennsylvania	**15145**
0100-0145	Radio Baghdad, Iraq	**11705**
0100-0145	Radio New Zealand Int'l....	15150, 17705
0100-0150	Deutsche Welle, West Germany	**6040, 6085 6145, 9545 9565, 9605 11785**
0100-0200	ABC, Perth, Australia	15425
0100-0200	Armed Forces Radio and TV...	**6030, 15345**
0100-0200	BBC, England	**5975, 6005 6120, 6175 7325, 9515 9590, 9915**
0100-0200	CBC Northern Quebec Srvc....	**6195**
0100-0200	CFCX, Montreal, Canada	6005
0100-0200	CFRX, Toronto, Canada	6070
0100-0200	CFVP, Calgary, Canada	6030
0100-0200	CHNX, Halifax, Canada	6130
0100-0200	CKFX, Vancouver, Canada	6080
0100-0200	FEBC, Manila, Philippines..	15315, 21475
0100-0200	KCBI, Texas	11910
0100-0200	KSDA, Guam (AWR)	15115
0100-0200	KVOH, California	**9495**
0100-0200	KYOI, Saipan	15405
0100-0200	Radio Australia	**15160, 15320 15395, 17715 17750, 17795**
0100-0200	Radio Belize	3285
0100-0200	Radio Canada International..	**5960, 9535 9755, 11845 9535, 11940**
0100-0200 M	Radio Cultural, Guatemala...	5955
0100-0200v	Radio Dublin International..	6910
0100-0200	Radio Havana Cuba	**6090, 9655**
0100-0200	Radio Moscow	**7165, 9600 9685, 9700 9720, 9765 9865, 11710 11750, 12060 15425**
0100-0200	Radio Moscow World Service.	**12000, 17676** 17850, **17860** 11845
0100-0200	Radio Prague, Czechoslovakia	**5930, 6055 7345, 9540 9740, 11990**
0100-0200	Radio Thailand	**9665**, 11905
0100-0200	SBC Radio 1, Singapore	11940
0100-0200	Spanish Foreign Radio, Spain	**9630, 11880**
0100-0200	Sri Lanka Broadcasting Corp.	6005, 9720 15425
0100-0200	Voice of America	**5995, 613 7205, 945 9650, 977 9815, 1158 11740, 1520**
0100-0200	Voice of Indonesia	9680, 1179
0100-0200v T-A	Voice of Nicaragua	6015v
0100-0200	WCSN, Boston, Mass	**11980**
0100-0200	WHRI, Indiana	**9852.5**
0100-0200	WINB, Pennsylvania	**15145**
0100-0200	WRNO Worldwide	**7355**
0100-0200	WYFR, Florida	**9680, 1185**
0115-0200	Radio Berlin International..	6080, 973
0130-0140	Voice of Greece	**7430, 939 9420**
0130-0200	HCJB, Ecuador	**9870, 1177 15155**
0130-0200	Radio Austria International.	**9550**
0130-0200	Radio Veritas Asia,Philipp.	15135, 1536
0130-0200	WINB, Pennsylvania	15145
0145-0200	Radio Berlin International..	**6125**

0200 UTC [10:00 PM EDT/7:00 PM PDT]

0200-0210	Radio France Int'l	**5950, 611 9715, 975**
0200-0215 S	Radio Austria Int'l	**9550**
0200-0215	Radio Budapest, Hungary	**6025, 952 9585, 983 11910**
0200-0230	BBC, England	**5975, 600 6120, 617 7135, 732 9410, 951 9590, 991**
0200-0230	Burma Broadcasting Corp	7185
0200-0230	Radio Berlin International..	**6125, 616**
0200-0245	Radio Berlin International..	**9560, 962**
0200-0230	Radio Kiev, Ukraine SSR	**7260, 964 9800, 1364**
0200-0230	Swiss Radio International...	**5965, 613 9725, 988 12035**
0200-0230 T-A	Voice of Nicaragua	6015
0200-0250	Deutsche Welle, W. Germany..	**7285**
0200-0256	Radio RSA, South Africa	**6010, 961**
0200-0300	ABC Perth, Australia	15425
0200-0300	Armed Forces Radio and TV...	**6030, 1534**
0200-0300	CBC Northern Quebec Service.	**6195, 962**
0200-0300	GBC, Guyana	5950
0200-0300	HCJB, Ecuador	**6205, 987 11775**
0200-0300	KSDA, Guam (AWR)	15115
0200-0300	KVOH, California	9495
0200-0300	KYOI, Saipan	15405
0200-0300	Radio Australia	15240, 1518 17705, 1771 **17750, 1775**
0200-0300	Radio Belize	3285
0200-0300	Radio Bras, Brazil	**11745**
0200-0300	Radio Bucharest, Romania	**5990, 615 9570, 1194**
0200-0300	Radio Cairo, Egypt	**9475, 967**
0200-0300 T-A	Radio Canada International..	**5960**, 975
0200-0300 T-S	Radio Dublin International..	6910
0200-0300	Radio Havana Cuba	**6140, 965**
0200-0300	Radio Moscow, U.S.S.R	**7165, 960 9685, 988 9700, 976 11710, 1175 12060**, 1205 **13605**, 1542
0200-0300	Radio Moscow World Service	**11670, 1184 17675, 1200 17850, 1788**
0200-0300	Radio New Zealand Int'l....	**15150**
0200-0300	Radio Polonia, Poland	**7145, 727 9525, 1512**
0200-0300	Radio Thailand	9665, 1190

frequency SECTION

0200-0300	Radio Veritas, Philippines.	9740, 15195
0200-0300	RAE, Argentina.....	**9690**
0200-0300	SBC Radio 1, Singapore.....	11940
0200-0300	Sri Lanka Broadcasting Corp.	6005, 9720
		15425
0200-0300	Voice of America.....	**5995, 6130**
		7205, 9455
		9650, 9775
		11580, 15205
0200-0300	Voice of Free China, Taiwan.	**5985, 9680**
		11740
0200-0300	WCSN, Boston, Mass.....	**9815**
0200-0300	WHRI, Indiana.....	**9852.5**
0200-0300	WINB, Pennsylvania.....	**15145**
0200-0300 M	World Music Radio.....	6910
0200-0300	WRNO Worldwide.....	**7355**
0200-0300	WYFR, Florida.....	**11805**
0215-0220	Radio Nepal.....	5005
0230-0300	BBC, England.....	**5975, 6005**
		6120, 6175
		7325, 9410
		9515, 9915
0230-0300	Radio Netherlands.....	**6020, 6165**
		9590, 11730
0230-0245	Radio Pakistan.....	5905, 7315
		11745, 15115
		15580, 17660
0230-0300	Radio Sweden Int'l.....	**9695**
0230-0300	Radio Tirana Albania.....	**7065, 9760**
0230-0300	SLBC, Sri Lanka.....	9720
0240-0250	All India Radio.....	6110, 9545
		9610
0250-0259	Radio Yerevan, Armenian SSR	11790, 11875
		13645

0300 UTC [11:00 PM EDT/8:00 PM PDT]

0300-0310	CBC Northern Quebec Service.	**6195**
0300-0315 W,A	Radio Budapest.....	**6025, 9520**
		9835, 11910
0300-0325	Radio Netherland.....	**6020, 6165**
		9590, 11730
0300-0330	BBC, England.....	**5975, 6005**
		6120, 6175
		6195, 7185
		7325, 9410
		9515, 9915
		12095, 15070
0300-0330	Radio Cairo, Egypt.....	**9475, 9675**
0300-0330	Radio Japan General Service	11870, 17825
0300-0330 T-A	Radio Portugal.....	**9705**
0300-0350	Deutsche Welle, West Germany	**6010, 6045**
		9545, 9565
0300-0350	Voice of Turkey.....	**9560**
0300-0400	Armed Forces Radio and TV...	**6030, 15345**
0300-0400	CFCX, Montreal, Canada.....	6005
0300-0400	CFRX, Toronto, Canada.....	6070
0300-0400	CFVP, Calgary, Canada.....	6030
0300-0400	CHNX, Halifax, Canada.....	6130
0300-0400	CKFX, Vancouver, Canada.....	6080
0300-0400	HCJB, Ecuador.....	**6205, 9870**
		11775
0300-0400	KYOI, Saipan.....	**17775**
0300-0400 M	La Voz Evangelica, Honduras	**4820**
0300-0400	Radio Australia.....	11945, **15160**
		15240, **15320**
		15395, **17715**
		17750, **17795**
0300-0400	Radio Beijing, China.....	**11980, 15180**
		15280
0300-0400	Radio Belize.....	3285
0300-0400	Radio Cultural, Guatemala...	5955
0300-0400 T-S	Radio Dublin International..	6910
0300-0400	WHRI, Indiana.....	**7355**
0300-0400	Radio Havana Cuba.....	**6140, 9655**
0300-0400	Radio Japan.....	**5960**
0300-0400	Radio Moscow.....	**7165, 9600**
		9640, 9685
		9765, 11670
		11710, 11845
		12000, 12070
		13605, 13645
		15230, 15415
		15425, 17850
		17860
0300-0400	Radio New Zealand Int'l....	11780, 15150
0300-0400	Radio Polonia, Poland.....	**7145, 7270**
		9525, 11815
		15120
0300-0400	Radio Prague, Czechoslovakia	**5930, 7345**
		9540, 11990
0300-0400	Radio RSA, South Africa.....	**3230, 7270**
		9585
0300-0400	Radio Sofia Bulgaria.....	**11750**
0300-0400	Radio Thailand.....	9560, 11905
0300-0400	SLBC, Sri Lanka.....	6005, 9720
		15425
0300-0400	Trans World Radio, Bonaire..	**9535**
0300-0400	Voice of America.....	**6035, 7200**
		9575, 9715
0300-0400	Voice of Free China, Taiwan.	**5985, 9680**
0300-0400	Voz Evengelica, Honduras....	4820
0300-0400	WCSN, Boston, Mass.....	**9815**
0300-0400	WINB, Pennsylvania.....	**15145**
0300-0400 S-F	WMLK, Pennsylvania.....	9455
0300-0400 M	World Music Radio.....	6910
0300-0400	WRNO Worldwide.....	**6185**
0300-0400	WYFR, Florida.....	**15440**
0310-0330	Vatican Radio.....	6150
0330-0400	Radio France International..	**6055, 7135**
		7175, **7280**
		9535, **9550**
		9790, 9800
		11700
0330-0400 M	CBC Northern Quebec Service.	**6195, 9625**
0330-0400	BBC, England.....	**3955, 5975**
		6175, 9410
		12095
0330-0400	Radio Berlin International..	**9560, 9620**
0330-0400	Radio Havana Cuba.....	**6140, 9655**
0330-0400	Radio Sweden International.	**11705**
0330-0400	Radio Tanzania.....	5985
0330-0400	Radio Tirana Albania.....	**7065, 9760**
0330-0400	UAE Radio, Dubai.....	**9640, 11940**
		15435, 17890
0335-0340	All India Radio.....	3905, 4860
		7105, 9545
		9610, 11830
		11895, 11940
0340-0400	Voice of Greece.....	**7430,** 9395
		9420
0345-0400	Radio New Zealand Int'l....	**11780**

0400 UTC [12:00 PM EDT/9:00 PM PDT]

0400-0405	RAI, Italy.....	**9710, 11910**
0400-0410	Voice of Kenya.....	6090
0400-0415	Kol Israel.....	**9435**
		9815, 9855
		11585
0400-0415	Radio Berlin Int'l,E.Germany	**9560, 9620**
0400-0415	Radio Cultural, Guatemala...	**3300**
0400-0425	Radio Netherlands.....	**7290, 9895**
0400-0425	Radio RSA, South Africa.....	**3230, 7270**
		9585
0400-0430	BBC, London, England.....	**3955, 5975**
		6005, 6175
		6195, 7160
		7185, 9410
		12095
0400-0430	Radio Bucharest, Romania....	**9510, 9570**
		11810, 11940
0400-0430 M	Radio Norway International..	**9600**
0400-0430	Swiss Radio International...	**6135, 9725**
		9885, 12035
0400-0430	Trans World Radio, Bonaire..	**9535**
0400-0500	ABC, Perth, Australia.....	15425
0400-0500	Armed Forces Radio and TV...	**6030, 15345**
0400-0500	Capital Radio, South Africa.	3927, 3930
		7149
0400-0500	CBC Northern Quebec Service.	**6195, 9625**
0400-0500	CFCX, Montreal, Canada.....	6005
0400-0500	CFRX, Toronto, Canada.....	6070
0400-0500	CFVP, Calgary, Canada.....	6030
0400-0500	CHNX, Halifax, Canada.....	6130
0400-0500	CKFX, Vancouver, Canada.....	6080
0400-0500	HCJB, Ecuador.....	**6205, 9870**
		11775
0400-0500	Radio Australia.....	**11910, 11945**
		15160, 15240
		15320, 15395
		17715, 17750
		17795
0400-0500	Radio Belize.....	**3285**
0400-0500 T-S	Radio Dublin International..	6910
0400-0500	Radio Havana Cuba.....	**5965, 6035**
		6090, 6140
		9655
0400-0500	Radio Moscow World Service.	**7165, 9640**
		9600, 9685
		9765, 11670
		11845, 13605
		13645, 15230
		15425, 17835
		17850, 17860
0400-0500	Radio New Zealand.....	**11780**
0400-0500	Radio Pyongyang, N.Korea...	15140, 15160
		15180
0400-0500	Radio Uganda.....	4976, 5026
0400-0500	RAE, Argentina.....	9690, 11710
0400-0500	VLW 15, Waneroom, Australia	15425
0400-0500	Voice of America.....	**3990, 5995**
		7200, 9575
		9670, 11925
0400-0500	WCSN, Boston, Mass.....	**9465**
0400-0500	WHRI, Indiana.....	**7400**
0400-0500v M	World Music Radio.....	6910
0400-0500	WRNO Worldwide.....	**6185**
0400-0500	WYFR, Florida.....	**11580**
0415-0430	Radio France International..	**6055, 7135**
		7175, 7280
		9550, 9790
		9800, 11700
		11995
0425-0440	RAI, Italy.....	5980, **7275**
0430-0500	BBC, London, England.....	**5975, 6195**
		7160, 7185
		9410, 9510
		12095
0430-0455	Radio Tirana Albania.....	**9480,** 11835
0430-0500	Deutsche Welle, W. Germany..	**7150, 7225**
		9565, 9765
0430-0500	Radio Austria International.	6155, **9550**
		11805
0430-0500	Radio Finland.....	**6120, 11715**
		11755
0430-0500	Radio Truth, S. Africa.....	5015
0430-0500	TWR, Swaziland.....	**7210**

0500 UTC [1:00 AM EDT/10:00 PM PDT]

0500-0505	Radio Belize.....	3285
0500-0510	CBC Northern Quebec Service	**6195, 9625**
0500-0510	Radio Lesotho.....	4800
0500-0515	Vatican Radio.....	**9645, 15190**
0500-0530	BBC, London.....	**5950, 5975**
		6005, 6190
		6195, 7160
		7185, 9410
		9510, 9580
		9600, 12095
0500-0530	Capital Radio, S. Africa....	3927.5
0500-0530 M	Radio Norway International.	**11865**
0500-0530 S,M	Trans World Radio, Bonaire..	**9535**
0500-0550	Deutsche Welle.....	**5960, 6120**
		6130, 9635
		9700
0500-0600	ABC, Melbourne, Australia..	15330
0500-0600	ABC, Perth, Australia.....	15425
0500-0600	Armed Forces Radio and TV...	**6030, 15330**
		15345
0500-0600	CFCX, Montreal, Canada.....	6005
0500-0600	CFRX, Toronto, Canada.....	6070
0500-0600	CFVP, Calgary, Canada.....	6030
0500-0600	CHNX, Halifax, Canada.....	6130
0500-0600	CKFX, Vancouver, Canada.....	6080
0500-0600	HCJB, Quito, Ecuador.....	**6205, 9870**
		11775
0500-0600	KYOI, Saipan.....	15190
0500-0600	Radio Australia.....	**11910, 15160**
		15240, 15395
		17715, 17750
		17795
0500-0600v	Radio Dublin International..	6910
0500-0600	Radio Havana Cuba.....	**5965, 6035**
		9655
0500-0600	Radio Korea.....	**6060, 9570**
0500-0600	Radio Moscow.....	**12050, 13605**
		13645
0500-0600	R. New Zealand, Wellington	11780
0500-0600	Radio Uganda.....	4976, 5026
0500-0600 S	Radio Zambia.....	11880
0500-0600	SBC Radio 1, Singapore.....	11940
0500-0600	Soloman Islands Bcasting Co	5020
0500-0600	Spanish Foreign Radio.....	**6125**
0500-0600	TWR, Swaziland.....	7210
0500-0600	VLW 15, Lyndhurst,Australia	15230
0500-0600	VLW 15, Waneroo, Australia.	15425
0500-0600	Voice of America.....	**5995, 6035**
		7200, 7280
		9575, 9670
		9760
0500-0600	Voice of Nicaragua.....	6015
0500-0600	Voice of Nigeria, Lagos.....	**7255**
0500-0600	WCSN, Boston, Mass.....	**9465**
0500-0600	WHRI, Indiana.....	**7400**
0500-0600v M	World Music Radio.....	6910
0500-0600 S	WRNO Worldwide.....	**6185**
0500-0600	WYFR, Florida.....	**7355, 11580**

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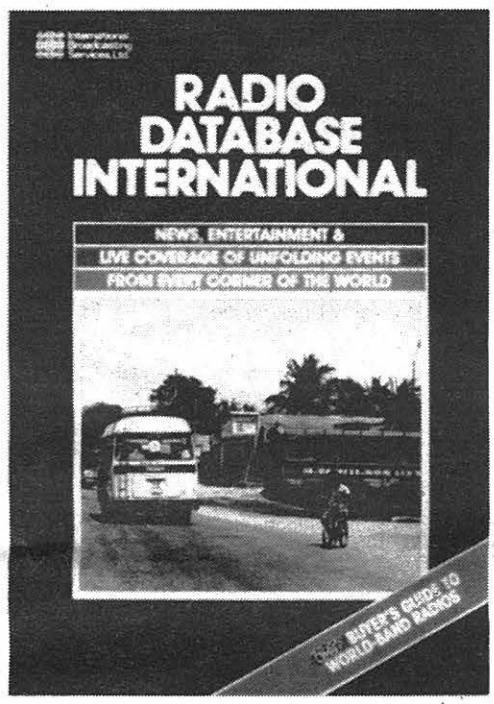

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frequency SECTION

0515-0530	Radio Canada Int'l,Montreal	**6050, 6140** **7295, 9750** **11840, 15180**
0530-0600	BBC, London.....	**5950, 5975** **6190, 7160** **9410, 9510** **9580, 12005**
0530-0600	Radio Cameroon.....	4850
0530-0600	Radio Netherland.....	**6165, 9715**
0530-0600	UAE Radio, Dubai.....	17775, 17830 21700
0530-0600	WSZO, Marshal Island.....	4970
0545-0600 M-F	Radio Canada Int'l,Montreal	**6050, 6140** **7295, 9750** **11840**

0600 UTC [2:00 AM EST/11:00 PM PST]

0600-0610	Ghana Radio.....	**4915**
0600-0610	Voice of Kenya.....	4808, 6090
0620 0630	Vatican Radio.....	**6185, 9645**
0600-0625	Radio Netherland.....	**6165, 9715**
0600-0630	Radio Australia.....	**11910, 11945** **15160, 15315** **15395, 17795**
0600-0645	WYFR, Florida.....	**6065, 7355** **9680, 9852**
0600-0700	Armed Forces Radio and TV...	**6030**
0600-0700	BBC, London.....	3975, **5900** **5950, 5975** **6050, 6195** **7105, 7150** **7185, 9410** 9515, **9600** **9640, 11760** **12095**
0600-0700	CFCX, Montreal, Canada.....	6005
0600-0700	CFRX, Toronto, Canada.....	6070
0600-0700	CFVP, Calgary, Canada.....	6030
0600-0700	CKFX, Vancouver, Canada.....	6080
0600-0700	CHNX, Halifax, Canada.....	6130
0600-0700	GBC-2, Accra, Ghana.....	**3366**
0600-0700	HCJB, Quito, Ecuador.....	**6205, 9870** **11775**
0600-0700	King of Hope, Lebanon.....	6280
0600-0700	KVOH, California.....	6005
0600-0700	KYOI, Saipan.....	15190
0600-0700	Radio Cook Islands.....	11760
0600-0700	Radio Havana Cuba.....	**9525**
0600-0700	Radio Moscow.....	**9765, 12050** **13645**
0600-0700	Radio New Zealand Int'l....	**11780**
0600-0700	Radio Pyongyang, N. Korea..	13650, 13680
0600-0700 S	Radio Zambia.....	11880
0600-0700	SBC Radio 1, Singapore.....	11940
0600-0700	Soloman Islands Bcasting Co.	5020
0600-0700	VLQ 9, Brisbane, Australia..	9660
0600-0700	VLW 15, Lyndhurst,Australia	15230
0600-0700	VLW 15, Waneroo, Australia.	15425
0600-0700	Voice of America.....	**5995, 6080** **6125, 9530** **9635, 9550** **9670**
0600-0700	Voice of Asia, Taiwan.....	7285
0600-0700	Voice of Malaysia.....	6175, 9750 15295
0600-0700	WCSN, Boston, Mass.....	**9465**
0600-0700	WHRI, Indiana.....	**9620**
0600-0700 S	WRNO Worldwide.....	**6185**
0600-0700	WSZO, Marsall Island.....	4970
0600-0700 S	World Music Radio.....	6910
0615-0700	Deutsche Welle, W. Germany..	**9625, 9700** **11765**
0620-0630	Vatican Radio.....	**6248, 9645**
0625-0700	TWR, Monaco.....	**7105**
0630-0700	Radio Australia.....	**11945, 15160** **15240, 15315** 15395, **17715** **17750**
0630-0655	Radio Finland.....	6120, **9560** **11755**
0630-0700	Radio Polonia.....	**9675**
0630-0700	Radio RSA, South Africa.....	5980, **9585** **11900**
0630-0700	Radio Sofia, Bulgaria.....	9700, **11720**
0630-0700	Radio Tirana.....	7065
0630-0700	Swiss Radio International...	**6165, 9535**
0645-0700 M-F	HCJB, Quito, Ecuador.....	**9845**

0700 UTC [3:00 AM EDT/12:00 AM PDT]

0700-0712	Radio Bucharest, Romania...	11940, 15250 15335, 17790 17805, 21665
0700-0715 A	Radio Finland.....	**11755**
0700-0730	Burma Broadcasting Corp.....	9730
0700-0730	BBC, London.....	**5950, 5975** **6195, 7120** **7150, 7185** **9410, 9600** **9640, 11860** **12095**
0700-0730	Radio Australia.....	**5995, 9655** **15160, 15240** **15395, 17715** **17750**
0700-0730v	Radio Zambia.....	11880v
0700-0735	TWR Swaziland.....	6070
0700-0745	Radio New Zealand Int'l....	**11780**, 15150
0700-0750	Radio Pyongyang.....	11930, 13750 15340
0700-0800	ABC Brisbane.....	9660
0700-0800	ABC Lyndwurst.....	9680
0700-0800	Armed Forces Radio and TV..	15400
0700-0800	CFCX, Montreal, Canada.....	6005
0700-0800	CFRX, Toronto, Canada.....	6070
0700-0800	CFVP, Calgary, Canada.....	6030
0700-0800	CHNX, Halifax, Canada.....	6130
0700-0800	CKFX, Vancouver, Canada.....	6080
0700-0800 A,S	ELWA, Liberia.....	11830
0700-0800	FEBC, Manila.....	11850, 15350
0700-0800	GBC-2, Accra, Ghana.....	**3366**
0700-0800	HCJB.....	**6130, 9745** **9845, 11925** **11835**
0700-0800	King of Hope, Lebanon.....	6280
0700-0800	KYOI, Saipan.....	15190
0700-0800	NBC, Papua New Guinea.....	4890
0700-0800	Radio Havana Cuba.....	**9525**
0700-0800	Radio Korea.....	**7550, 13670**
0700-0800	Radio Kuwait.....	9560
0700-0800	Radio Thailand.....	9655, 11905
0700-0800	SBC Radio 1, Singapore.....	5010, 11940
0700-0800	Soloman Islands Bcasting Svc	5020
0700-0800	VLM4 Brisbane, Australia....	4920
0700-0800	Voice of Free China.....	**5985**
0700-0800	Voice of Malaysia.....	6175, 9750 15295
0700-0800	Voice of Nigeria.....	15120, 15185 17800
0700-0800	WCSN, Boston, Mass.....	**9465**
0700-0800	WHRI, Indiana.....	7355
0700-0800 S	World Music Radio.....	6910
0700-0800 S	WRNO Worldwide.....	**6185**
0700-0800	WSZO, Marsall Island.....	**4940**
0700-0800	WYFR, Florida.....	**6065, 9680** **11580**
0715-0730 M-A	Vatican Radio.....	**11725**, 15190
0715-0800 S	FEBA Radio, Seychelles.....	15120, 17795
0725-0800	TWR Monte Carlo.....	**7105**
0730-0735	All India Radio.....	5990, 6010 6020, 6050 7110, 7250 9610, 11730 11850, 11935
0730-0800	BBC, London.....	**9410, 9600** **9640, 11860** **12095**
0730-0800 S	CPBS, China.....	11330
0735-0800 M-H	KTWR, Guam.....	**11715**
0730-0800	Radio Australia.....	**5995, 9655** **11720**, 15240 15395, 17715 17750
0730-0800	Radio Netherlands.....	**9630, 9715**

0800 UTC [4:00 AM EDT/1:00 AM PDT]

0800-0805	GBC, Accra, Ghana.....	3366
0800-0825 M-F	BRT, Belgium.....	**9880**
0800-0825	Radio Netherlands.....	**9630, 9715**
0800-0825	Voice of Malaysia.....	6175, 9750 15295
0800-0830	Voice of Islam,Bangladesh..	12030, 15525
0800-0830	HCJB, Quito, Ecuador.....	**6130, 9745** **9845, 11835** **11925**
0800-0845 S	FEBA, Seychelles.....	15120, 17795
0800-0900	AFAN, Antarctica.....	6012
0800-0900	AFRTS Far East Network.....	11750
0800-0900	BBC, London.....	**7150, 9410** **9600, 9640** **11860**
0800-0900 S	BBS, Bhutan.....	6035
0800-0900	CFCX, Montreal, Canada.....	6005
0800-0900	CFRX, Toronto, Canada.....	6070
0800-0900	CFVP, Calgary, Canada.....	6030
0800-0900	CHNX, Halifax, Canada.....	6130
0800-0900	CKFX, Vancouver, Canada.....	6080
0800-0900	FEBC, Manila.....	6030, 1189 21475
0800-0900	FEN, Tokyo.....	3910, 615
0800-0900 S,A	GBC-2, Accra, Ghana.....	3366
0800-0900	King of Hope, Lebanon.....	6280
0800-0900	KNLS, Anchor Point, Alaska.	5960
0800-0900	KYOI, Saipan.....	**11900**
0800-0900	Radio Australia.....	**9580, 965** **11720**, 1539 17715, 1775
0800-0900	Radio Korea World News Svc..	7275
0800-0900	Radio Kuwait.....	9750
0800-0900	Radio Moscow.....	9795
0800-0900	Radio new Zealand Int'l.....	**9450, 1178**
0800-0900 S	Radio Prague.....	6055, 950 11990
0800-0900	Radio Pyongyang, N. Korea..	9530, 1368 11830, 1516 15180
0800-0900	RTE Portugal.....	**9670**
0800-0900	SBC Radio 1, Singapore.....	5010, 1194
0800-0900	TWR Monte Carlo.....	**7105**
0800-0900	VLW15, Waneroo, Australia..	**15425**
0800-0900	Voice of Indonesia.....	11790, 1515
0800-0900	Voice of Nigeria.....	**7255**, 1518
0800-0900	WCSN, Boston.....	**9465**
0800-0900	WHRI, Indiana.....	**7355**
0800-0900 S	WRNO Worldwide.....	**6185**
0800-0900	WSZO, Marsall Island.....	**4940**
0800-0900	WYFR, Florida.....	**11580**
0815-0845	Voice of America, Washington	**7175, 957** **9750**
0830-0840	All India Radio.....	5960, 597 5990, 601 6020, 605 6100, 711 7125
0830-0855	Radio Finland, Helsinki.....	6120, 1524
0830-0855 M-A	Radio Netherlands.....	**9630**
0830-0900	Radio Austria Int'l.....	7210, 1184
0830-0900	Radio Beijing.....	9700, 1175 15440
0830-0900	Radio Prague,Czechoslovakia	11855, 1784 21705
0830-0900	HCJB, Quito, Ecuador.....	**6130, 974** **11925**
0830-0900	Radio Netherlands.....	17575, 2148
0830-0900	Swiss Radio International...	**9560, 988** 11905, 1557
0847-0852 A	R. Pacific Ocean, Vladivost.	9500, 962 9535, 979 9810, 1171 11815, 1191 12010, 1526 15295, 1776 17815, 1785

0900 UTC [5:00 AM EDT/2:00 AM PDT]

0900-0905	Africa Number One, Gabon....	7200, **1520**
0900-0915	BBC, London.....	5975, 604 7150, **941** **11860, 1209** **15070, 1540** **17790, 1808**
0900-0925	Radio Netherlands.....	17575, 2148
0900-0930	Radio Australia.....	**9580, 965** **9710, 1172** 15415
0900-0930	Radio Korea.....	7275
0900-0950	Radio Pyongyang N. Korea....	9765, 1183 13650
0900-1000	ABC, Brisbane, Australia....	4920, 966
0900-1000	AFRTS.....	**6030, 953**
0900-1000	CFRX, Toronto.....	**6070**
0900-1000	Deutsche Welle.....	6160, **969** **9720**
0900-1000	FEBC, Manila.....	11890, 2147
0900-1000	FEN, Tokyo.....	6155
0900-1000	HCJB, Quito, Ecuador.....	**6130, 974** **11925**
0900-1000	King of Hope, Lebanon.....	6280
0900-1000	KNLS, Alaska.....	5960
0900-1000	KSDA, Guam.....	15440
0900-1000	KYOI, Saipan.....	**11900**

frequency SECTION

0900-1000	Radio Afghanistan.....	6085, 9590 15255, 17655
0900-1000	Radio Japan.....	9675, 11875 11955, 15235 17810
0900-1000	Radio Moscow.....	9795, **11790** **11850**, 13680 **15375**
0900-1000	Radio Tanzania.....	9685v
0900-1000 S	Radio Prague.....	6055, 9505 11990
0900-1000	SBC Radio 1, Singapore.....	5010, 11940
0900-1000	TWR Monte Carlo.....	7105
0900-1000	VLW15, Waneroo, Australia..	**15425**
0900-1000	Voice of Nigeria.....	15120, 15185 17800
0900-1000	WCSN, Boston.....	**9465**
0900-1000	WHRI, Indiana.....	**7355**
0900-1000	WRNO Worldwide.....	6185
0900-1000	WSZO, Marsall Island.....	4970
0915-1000	BBC, London.....	**9760, 9750** **11750**
0930-1000	Radio Australia.....	**9580, 9655** **9710**
0930-1000	Radio Budapest Hungary.....	**11910**
0930-0940 M-F	Radio Canada Int'l,Montreal	**5960, 9755**
0930-1000	Radio New Zealand.....	**6100, 9540**

1000 UTC [6:00 AM EDT/3:00 AM PDT]

1000-1010	Voice of Kenya.....	9665
1000-1025 M-A	BRT, Belgium.....	15515, 17595
1000-1030	Afghanistan.....	6085, 9590 15255, 17655
1000-1030	Deutsche Welle, W. Germany..	7225, 9735 17765, 21600
1000-1030	Kol Israel.....	**11585**, 11605 15095, **15640** 15650, 17630 17815
1000-1030	Radio Australia.....	**5995, 9580** **9655, 9770** **15415**
1000-1030 S	Radio Norway International.	**11870, 15170** **15175, 15180** **15230, 21730**
1000-1030	Swiss Radio Int'l.....	**9560, 9885** **11905, 15570**
1000-1030	Voice of Vietnam.....	9755, 9765 12035
1000-1100	ABC, Perth, Australia.....	**9610**
1000-1100	AFRTS.....	**6030**, 6125 **9530, 9700**
1000-1100	All India Radio.....	11705, 11810 15320, 15335 17387, 17875
1000-1100	BBC, London.....	**9740, 9750** **9760, 12095** **15070, 15400** **17705, 17790** **18080**
1000-1100	B.S. Kingdom Saudi Arabia..	11855v
1000-1100	CFCX, Montreal, Canada.....	6005
1000-1100	CFRX, Toronto, Canada.....	**6070**
1000-1100	CFVP, Calgary, Canada.....	6030
1000-1100	CHNX, Halifax, Canada.....	6130
1000-1100	CKFX, Vancouver, Canada.....	6080
1000-1100	FEN, Japan.....	3910, 6155
1000-1100	HCJB, Quito, Ecuador.....	**6130, 9745** **11925**
1000-1100	KNLS, Alaska.....	**11930**
1000-1100	KYOI, Saipan.....	**11900**
1000-1100	Radio Honaire, Soloman Ils..	5020
1000-1100	Radio Korea.....	**15575**
1000-1100	Radio Moscow.....	**9540, 9600** **11790, 11850** **15375, 17820**
1000-1100	Radio New Zealand Int'l.....	9600, 11780
1000-1100 S	Radio Prague.....	6055, 9505 **11990**
1000-1100	SBC Radio 1, Singapore.....	5052, 11940
1000-1100	Voice of Nigeria.....	7255, 15120
1000-1100	WCSN, Massachusetts.....	**17640**
1000-1100	WHRI, Indiana.....	**7355**
1000-1100 S	WRNO Worldwide.....	6185
1000-1100	WYFR, Florida.....	**9550, 6105**
1005-1010	Radio Pakistan.....	15605, 17660
1030-1040	Voice of Asia, Taiwan.....	5980
1030-1100	Radio Australia.....	**9580, 9770**
1030-1100	Radio Netherland.....	**6020, 9650**
1030-1100	Sri Lanka Broadcasting Corp	11835, 15120 17850
1030-1100	UAE Radio, Dubai.....	**15435**, 17775 **17865**, 21605
1045-1100	Vatican Radio.....	6250, 9645 **11740**
1040-1050	Voice of Greece.....	15630, 17565
1045-1000	Radio Nepal.....	5005, 9590
1050-1100 M-F	Radio Budapest Hungary.....	6025, 7225 9835, **11910** **17710**

1100 UTC [7:00 AM EDT/4:00 AM PDT]

1100-1115	Radio Pakistan.....	15605, 17660
1100-1120	Radio Budapest, Hungary.....	6025, 6175 7225, 9790 9805, **9835** **11910**, 15365 15425, 17710 17720, 17850 21620
1100-1125	Radio France Int'l, Paris..	**9790, 11670** **11690, 11845** **15155, 15195** **15300, 15315** **15365, 17620** **17720, 17850**
1100-1125	Radio Netherland.....	**6020, 9650**
1100-1130	Radio Australia.....	5995, 6080 **7215, 9580** **9645, 9710** **9770, 11705** **11800**
1100-1130 M-A	Radio Finland.....	**11945, 15400**
1100-1130	Radio Japan General Service.	5990, **6120** 17810
1100-1130	Radio Maputo, Mozambique....	9525, 11815
1100-1130	Radio Sweden Int'l.....	9630, 15115
1100-1130	Sri Lanka Broadcasting Corp	11835, 15120 17850
1100-1130	Swiss Radio International..	**11935, 15570** **15585, 17830**
1100-1130	Voice of America.....	**9760, 11715** **15160, 15425**
1100-1130	Voice of Vietnam.....	9755, 9765 12035
1100-1156	Radio RSA, South Africa....	11900, 15220 17780
1100-1200	4VEH, Haiti.....	4930
1100-1200	ABC, Brisbane, Australia....	4920
1100-1200	ABC, Perth, Australia.....	**9610**
1100-1200	AFRTS.....	**6030, 9700** **15430**
1100-1200	BBC, London.....	**5965, 6195** **9510, 9750** 9760, **11775** **12095, 15070** **17705, 17790** **18080**
1100-1200	B.S. Kingdom Saudi Arabia..	11855v
1100-1200	CFCX, Montreal, Canada.....	6005
1100-1200	CFRX, Toronto, Canada.....	6070
1100-1200	CFVP, Calgary, Canada.....	6030
1100-1200	CHNX, Halifax, Canada.....	6130
1100-1200	CKFX, Vancouver, Canada.....	6080
1100-1200	KYOI, Saipan.....	**11900**
1100-1200	Radio Beijing.....	**9535**
1100-1200	Radio Korea.....	7275, 15575
1100-1200	Radio Malaysia, Sarawak.....	4950
1100-1200	Radio Moscow.....	**9600, 15475**
1100-1200	Radio New Zealand.....	6100, 9600
1100-1200	Radio Pyongyang, N. Korea...	7300, 9750 9977
1100-1200	SBC Radio 1, Singapore.....	5052, 11940
1100-1200	Voice of Asia, Taiwan.....	5980, 7445
1100-1200	Voice of Nigeria.....	7255, 15120
1100-1200	WCSN, Massachusetts.....	**17640**
1100-1200	WHRI, Indiana.....	**5995**
1100-1200 S	WRNO Worldwide.....	9715
1100-1200	WYFR, Florida.....	5985, **9680** 11875
1115-1200	Radio Berlin International.	**17880, 21465** **21540**
1115-1200	TWR, Bonaire.....	**11815**
1115-1130	Vatican Radio.....	**17840, 21485**
1115-1200	Voice of Islamic Rep. Iran.	11790
1130-1200	Deutsche Welle,W.Germany...	**15410, 17765** **17800, 21600**
1130-1200	HCJB, Quito, Ecuador.....	11740
1130-1200	Radio Australia.....	6060, 6080 7215, **9580** 9645, **9710** **9770**
1130-1200	Radio Netherland.....	**9715, 15560** **17605**
1130-1200	Radio Thailand.....	9655, 11905
1130-1200	Trans World Radio Bonaire..	**11815**
1145-1200	Radio Berlin Intl.....	**15240**

1200 UTC [8:00 AM EDT/5:00 AM PDT]

1200-1210	Voice of Is.Rep.of Iran....	11790, 15084
1200-1215	Radio New Zealand.....	**9540**
1200-1215 M-A	Vatican Radio.....	**15190, 17840** **17865, 21485**
1200-1215 S	Vatican Radio.....	**17840**, 21485
1200-1215	Voice of People of Kampuchea	9693, 11938
1200-1225	Radio Bucharest, Romania...	**11740**, 15345
1200-1225	Radio Netherland.....	5955, 9715 **15560**, 17575 **17605**, 21480
1200-1225	Radio Polonia.....	6095, 7285
1200-1230	Radio Australia.....	**5995, 6060** **6080, 7205** **7215, 9580** **9710, 9770** **11800**
1200-1300	Radio Beijing.....	**9535, 11650**
1200-1230	Radio Berlin Intl.....	**15240**
1200-1230	Radio Canada Intl.....	**9625, 11955**
1200-1230 M-A	Radio Finland.....	**11945, 15400**
1200-1230	Radio Tashkent.....	7325, 9600 9715, 15460
1200-1235	All India Radio.....	3905, 4800 4920, 7280 9565, 9615 11620, 15245
1200-1235	Radio Ulan Bator Mongolia..	**12015**
1200-1242	Trans World Radio Bonaire..	**11815**
1200-1250	Radio Pyongyang, N. Korea...	**9977**
1200-1300	4VEH, Haiti.....	4930
1200-1300	ABC, Wanneroo, Australia....	6140, **9610**
1200-1300	ABC, Brisbane.....	4920
1200-1300	AFRTS.....	**6030, 9700** **15430**
1200-1300	BBC, London.....	**6195, 9510** 9750, **11775** **12095, 15070** **17705, 18080**
1200-1300	B.S. Kingdom Saudi Arabia..	11855v
1200-1300	CBC Northern Quebec Service.	**6065, 9625**
1200-1300	CFCX, Montreal, Canada.....	6005
1200-1300	CFRX, Toronto, Canada.....	6070
1200-1300	CFVP, Calgary, Canada.....	6030
1200-1300	CHNX, Halifax, Canada.....	6130
1200-1300	CKFX, Vancouver, Canada.....	6080
1200-1300	FEN, Tokyo.....	3910, 6155
1200-1300	GBC, Accra, Ghana.....	7295
1200-1300	HCJB, Quito, Ecuador.....	**11740**, 11745 **15115, 17890**
1200-1300	KYOI, Saipan.....	**11900**
1200-1300	Pt Moresby,Papua New Guinea	4890
1200-1200	Radio Moscow.....	**9600, 11790** **11850, 13680** **13710, 15360** **15375, 15475** **15490, 17665** **17645, 17820**
1200-1300	Radio Tanzania.....	9685
1200-1300	RAE, Argentina.....	15345
1200-1300	SBC Radio 1, Singapore.....	5010, 5052 11940
1200-1300	Voice of America.....	**9760, 11715** **15425**
1200-1300	WHRI, Indiana.....	**5995**
1200-1300 S	WRNO Worldwide.....	9715
1200-1300	WYFR, USA.....	**11830**
1210-1300	Voice of Nigeria.....	7255, 15120
1215-1300	Radio Cairo.....	17675
1215-1245	Radio Japan Regional Serv..	11875, 15300
1230-1300	Radio Austria International	**15320**
1230-1300	Radio Australia.....	**6060, 7205** **7215, 9580**
1230-1300	Radio Bangladesh.....	15525, 12030
1230-1300	Radio Berlin Int'l.....	21465
1230-1300	Radio Jordan.....	9560
1230-1300	Radio Polonia.....	15190, 15430
1230-1300	Radio Sweden Int'l.....	**15190, 17785**
1230-1300	TES Radio Veritas,Philippns.	6160
1230-1300	Sri Lanka Broadcasting Corp.	6075, 9720 15425
1230-1300	Voice of Turkey.....	15255
1230-1300	WYFR, Florida.....	15055
1235-1245	Voice of Greece.....	**11645**, 15360 **15630**, 17565
1245-1300	Radio Korea, South.....	**15575**
1255-1300 M-A	Radio Ulan Bator Mongolia...	7235, 9575 15305
1255-1300	TWR, Sri Lanka.....	11825
1255-1330 A-S	TWR, Bonaire.....	**11815**

frequency SECTION

1300 UTC [9:00 AM EDT/6:00 AM PDT]

1300-1315		Radio Berlin International.	21465
1300-1330		BBC, London.....	9510, 11775
			15070, 17705
			17780, 17790
1300-1330		Radio Australia.....	5995, 6060
			6080, **7205**
			9580
1300-1330		Radio Bucharest, Romania...	11940, 15250
1300-1330		Radio Finland.....	15400, 11945
1300-1330	S	Radio Norway International.	**6040**, **9590**
			17775
1300-1330		Swiss Radio Int'l, Berne...	15570, 17830
1300-1337	A-S	TWR, Bonaire.....	11815
1300-1330	S	WRNO, Worldwide.....	**9715**
1300-1350		Radio Pyongyang, N. Korea...	9345, 11665
1330-1355	S	Radio Finland.....	11945, 15400
1300-1400		4VEH, Haiti.....	4930
1300-1400		ABC Waneroo, Australia.....	6140, 9610
1300-1400		AFRTS.....	**9700**, **15330**
1300-1400		B.S. Kingdom Saudi Arabia..	11855v
1300-1400		CFCX, Montreal, Canada.....	6005
1300-1400		CFRX, Toronto, Canada.....	6070
1300-1400		CFVP, Calgary, Canada.....	6030
1300-1400		CHNX, Halifax, Canada.....	6130
1300-1400		CKFX, Vancouver, Canada.....	6080
1300-1400		CKZU, Vancouver, Canada.....	6160
1300-1400		FEBC, Manila.....	11850
1300-1400		FEN, Tokyo.....	6155
1300-1400		GBC, Accra, Ghana.....	7295
1300-1400		HCJB, Quito, Ecuador.....	**11740**, **15115**
			17890
1300-1400		NBC, Port Moresby, Papua New Guinea.....	4890
1300-1400		Radio Beijing.....	**9730**
1300-1400	S	Radio Canada Int'l.....	**11955**, **15440**
1300-1400		Radio Jordan.....	**9560**
1300-1400		Radio Korea.....	**15575**
1300-1400		Radio Moscow.....	**11840**, **15375**
			15475, 15585
1300-1400		Radio RSA, South Africa....	15220, 21535
			21590
1300-1400		SBC Radio 1, Singapore.....	5010, **5052**
			11940
1300-1400		Sri Lanka Broadcasting Corp.	6075, 9720
			15425
1300-1400		TWR, Sri Lanka.....	**11825**
1300-1400		Voice of America.....	6110, 7230
			9660, **9760**
			15205
1300-1400		Voice of Nigeria.....	7255, 15120
1300-1400		WHRI, Indianapolis.....	**11790**
1300-1400		WYFR, USA.....	**5985**, 11830
			11875, **15055**
1315-1400		Radio Berlin Int'l.....	11795, 15445
			17700
1330-1400		All India Radio.....	11810, 15335
1330-1400		Laotian National Radio.....	7113v
1330-1400		BBC, London.....	9750, 9760
			12095, 15070
			17885, 21710
1330-1400	M-A	BBS, Bhutan.....	**6035**
1330-1445		BBS, Burma.....	**4725**
1330-1355	M-A	BRT, Belgium.....	**15515**, **15590**
1330-1400		Radio Australia.....	5995, 6060
			6080, **7135**
			9580
1330-1400	M-A	Radio Budapest Hungary.....	9835, 11910
			15160, 15220
			17710, 21665
1330-1400	S	Radio Finland.....	**11945**, **15400**
1330-1400		Radio Tashkent.....	**7325**, 9715
			15460
1330-1400		Radio Yugoslavia.....	9620, 15240
1330-1400		Swiss Radio International..	**9730**, **9885**
			11905, **11955**
			12030
1330-1400		U.A.E. Radio.....	**15435**, **17865**
			21605
1330-1400		Voice of Vietnam.....	**9755**, **9840**
			12020, **12035**
1330-1400	S	WRNO, Worldwide.....	**9715**
1337-1400	A	TWR, Bonaire.....	11815
1345-1400		Vatican Radio.....	7250, 9645
			11740

1400 UTC [10:00 AM EDT/7:00 AM PDT]

1400-1415		GBC-2, Accra, Ghana.....	7295
1400-1430		Radio Australia.....	**5995**, **6080**
			7135, **9580**
1400-1430		Radio Finland.....	15400
1400-1430		Radio Japan General Service	**11870**
1400-1430	S	Radio Norway International.	**11860**, **15240**
1400-1430		Radio Sweden International.	11785, **15345**
1400-1500		AFRTS.....	**9700**, 11805
			15330, 15430
1400-1500		All India Radio.....	11810, 15335
1400-1500		BBC, London.....	12095, **15070**
			15275, 17705
			17790, 17885
1400-1500		CBC Northern Quebec Service.	9625, **11720**
1400-1500		CFCX, Montreal, Canada.....	6005
1400-1500		CFRX, Toronto, Canada.....	6070
1400-1500		CFVP, Calgary, Canada.....	6030
1400-1500		CHNX, Halifax, Canada.....	6130
1400-1500		CKFX, Vancouver, Canada.....	6080
1400-1500		FEBC, Manila.....	9665, 11815
			11850
1400-1500		HCJB, Quito, Ecuador.....	**11740**, **15115**
			17890
1400-1500		Kuching, Sarawak, Malaysia	4950
1400-1500	S	Radio Canada International.	**11720**, **11955**
			15440
1400-1500		Radio Jordan.....	9560
1400-1500		Radio Moscow.....	**11840**, **13680**
			11950, **15375**
1400-1500		Radio Pyongyang,N.Korea.....	7300, 9555
			9750
1400-1500		Radio RSA, South Africa.....	**21590**
1400-1500		Radio Veritas, Philippines	6160
1400-1500		SBC Radio 1, Singapore.....	5010, 5052
			11940
1400-1500		Sri Lanka Broadcasting Corp.	6075, 9720
			15425
1400-1500		TWR, Sri Lanka.....	**11825**
1400-1500		Voice of America.....	6110, 7230
			9760, 11715
1400-1500		WHRI, Indiana.....	**11790**
1400-1500	S	WRNO Worldwide.....	**11965**
1415-1430	A,S	KTWR, Guam.....	9870
1415-1500		Radio Berlin Int'l.....	15240
1415-1430		Radio Nepal.....	5005
1415-1500	S,A	GBC-2, Accra, Ghana.....	3366
1430-1500		KTWR Guam.....	**9840**
1430-1500		Radio Australia.....	5995, 6060
			6035, 6080
			7205, **9580**
1430-1500	M-A	Radio Budapest Hungary.....	**11910**, **15055**
			15220, **17710**
			21525, **21665**
1430-1500		Radio Korea, South.....	**9750**, **15575**
1430-1500		Radio Netherland.....	5955, 11735
			13770, 15560
			17575
1430-1500		Radio Yugoslavia.....	9620, 15240
1430-1500		WYFR, USA.....	**9535**, **11830**
			11875, **15055**
1448-1455		Radio Vatican.....	**15090**
1445-1500		Radio Ulan Bator, Mongolia..	9575

1500 UTC [11:00 AM EDT/8:00 AM PDT]

1500-1505	M-F	Africa #1, Gabon.....	15200
1500-1520		Radio Ulan Bator Mongolia...	9615, 12015
1500-1525		TWR, Sri Lanka.....	**11825**
1500-1530		BBS, Burma.....	4725
1500-1530		HCJB, Quito, Ecuador.....	11740, 15115
			17890
1500-1530		Radio Berlin Int'l.....	15255
1500-1530		Radio Netherland.....	13770, 15560
1500-1530		Radio Veritas, Philippines..	9565, 15120
1500-1530		TWR, Guam.....	9870
1500-1530		Voice of Nigeria.....	7255, 11770
1500-1550		Deutsche Welle.....	15135, 17825
1500-1556		Radio RSA, South Africa....	17780, 21590
1500-1600		AFRTS.....	**15330**, **15430**
1500-1600		BBC, London.....	**12095**, **15070**
			17885, **17790**
1500-1600	A,S	BBC, London.....	**11775**, **15260**
1500-1600		CBC Northern Quebec Service.	9625, 11720
1500-1600		CFCX, Montreal, Canada.....	6005
1500-1600		CFRX, Toronto, Canada.....	6070
1500-1600		CFVP, Calgary, Canada.....	6030
1500-1600		CKFX, Vancouver, Canada.....	6080
1500-1600		CHNX, Halifax, Canada.....	6130
1500-1600		FEBC, Manila.....	9670, 11850
1500-1600		KTWR Guam.....	9840
1500-1600		Radio Australia.....	5995, 6060
			6080, 6035
			7205, **7215**
			9580
1500-1600	S	Radio Canada International.	9625, **11720**
			11955, **15440**
1500-1600		Radio Japan General Service.	9695, 21700
1500-1600		Radio Jordan.....	9560
1500-1600		Voice of Indonesia.....	11790, 15150
1500-1600		V. Revolutionary Ethiopia..	9560
1500-1600		WHRI, Indiana.....	**15105**
1500-1600		WRNO Worldwide.....	**11965**
1500-1600		WYFR, Florida.....	**9535**, 11
			11830, 11
			15170
1513-1600	F-S	FEBC, Seychelles.....	11820
1530-1600		KNLS, Alaska.....	**7355**
1530-1545		Radio Bangladesh.....	7195
1530-1600		R. Prague, Czechoslovakia..	9735, 11
			11990, 13
			17705, 17
			21505
1530-1600		Swiss Radio International..	9735, 11
			15430
1530-1600		Voice of Asia, Taiwan.....	5980, 7
1540-1550		Voice of Greece.....	11645, 15
			17565
1545-1600		Vatican Radio.....	11810, 15
			17730
1500-1600		RTM, Sarawak, Malaysia.....	4950
1500-1600		SBC Radio 1, Singapore.....	5010, 5
			11940
1500-1600		Sri Lanka Broadcasting Corp.	6075, 9
			15425
1500-1600		Voice of America.....	15205
1500-1600		Voice of Nigeria.....	7255, 11
1500-1600		Radio Korea.....	**9870**
1500-1600		Radio Moscow.....	**11790**, 11
			11850, 11
			11950, 13
			15375

1600 UTC [12:00 PM EDT/9:00 AM PDT]

1600-1605		SBC Radio 1, Singapore.....	11940
1600-1615		Radio Pakistan.....	9645, 116
			11675, 117
			11925, 155
			15595, 176
1600-1630	S	Radio Norway International.	**7265**, **97**
			11860, **118**
1600-1630	M-F	Radio Portugal.....	15105
1600-1630		Radio Sweden Int'l.....	**15110**
1600-1630		*Voice of Vietnam*.....	9755, 98
			12020, 120
1600-1640		UAE Radio.....	9640, **117**
			15320, **177**
1600-1645		TWR, Swaziland.....	3200
1600-1700		AFRTS.....	9700, 153
			15430
1600-1700		BBC, London.....	**11775**, 120
			15070, **152**
			15400, **178**
1600-1700	A	CBC Northern Quebec Service.	9625, 117
1600-1700		CFCX, Montreal, Canada.....	6005
1600-1700		CHNX, Halifax, Canada.....	6130
1600-1700		CFRX, Toronto, Canada.....	6070
1600-1700		CFVP, Calgary, Canada.....	6030
1600-1700		CKFX, Vancouver, Canada.....	6080
1600-1700	S	KCBI, Texas.....	**11735**
1600-1700		KNLS, Alaska.....	7355
1600-1700		KYOI, Saipan.....	9665
1600-1700		Radio Australia.....	**5995**, 72
			7215, 95
1600-1700		Radio Beijing.....	**9570**, 116
1600-1700		Radio France International.	**6175**, **98**
			11705, 118
			17620, 177
1600-1700		Radio Jordan.....	9560
1600-1700		Radio Korea.....	5975, 98
1600-1700		Radio Malawi.....	3380, 59
1600-1700		Radio Moscow.....	**11790**, 118
			11860, 119
1600-1700		Radio Prague, Czech.....	11990, 137
			15110, 177
1600-1700		Radio Riyadh, Saudi Arabia..	9720v
1600-1700		Radio Tanzania.....	6105
1600-1700		Radio Zambia.....	9505
1600-1700		Voice of America.....	9575, 152
			15410, 154
			15580, 156
			17785, 178
			17870
1600-1700		Voice of Nigeria.....	7255, 117
1600-1700		WCSN, Boston, Mass.....	15270
1600-1700		WHRI, Indiana.....	**15105**
1600-1700		WINB, Pennsylvania.....	15295
1600-1700		WMLK, Pennsylvania.....	9455
1600-1700		WRNO Worldwide.....	**11965**
1600-1700		WYFR, Florida.....	**9535**, 118
			11875, 151
			15440, 178
			21525
1610-1620	M-F	Radio Botswana.....	4820, 72
1610-1645		Radio Belem.....	3205
1630-1655	M-A	BRT Belgium.....	17595
1630-1700		ELWA, Liberia.....	11830
1630-1700		Radio Nacional Angola.....	7245, 95
			11955

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1630-1700		Radio Netherland.....	6020, 9515
1630-1700		Radio Polonia.....	7125, 9525
1630-1700		Radio Sofia, Bulgaria.....	11735, 11840
			15310
1630-1700		Voice of Africa, Egypt.....	15255
1645-1700		Radio Berlin Int'l.....	9730
1645-1700		Radio Pakistan.....	6205, 7100
			9560, 9465

1700 UTC [1:00 PM EDT/10:00 AM PDT]

1700-1710		Voice of Lebanon.....	6548
1700-1715		Kol Israel.....	9460, 11585
			13750, 15095
1700-1720		Radio Netherland.....	6020, **9515**
1700-1730		Radio Australia.....	**5995,** 6035
			6060, **6080**
			7205, **7215**
1700-1730		Radio Berlin Int'l.....	**9580,** 9730
1700-1730		Radio Japan.....	5990, **9695**
1700-1730	S	Radio Norway International.	**11850, 15230**
1700-1745		BBC, England.....	**11775, 12095**
			15070, 15260
1700-1800		AFRTS.....	**9700, 11805**
			15330, 15345
			15430
1700-1800		CBC, N. Quebec, Canada....	9625, 11720
1700-1800		CFCX, Montreal, Canada.....	6005
1700-1800		CFRX, Toronto, Canada.....	6070
1700-1800		CFVP, Calgary, Canada.....	6030
1700-1800		CHNX, Halifax, Canada.....	6130
1700-1800		CKFX, Vancouver, Canada.....	6080
1700-1800		CKZU, Vancouver, Canada.....	6160
1700-1800		KCBI, Dallas.....	**11735**
1700-1800		KNLS, Alaska.....	7355
1700-1800		KYOI, Saipan.....	9665
1700-1800		Radio Beijing.....	9570, 11600
1700-1800		Radio Havana Cuba.....	**9695, 9730**
			11950, 11755
			11850, 15270
1700-1800		Radio Korea, South.....	**7550,** 15575
1700-1800		Radio Moscow.....	**11840, 11850**
			11860, 12030
1700-1800	MWF	Radio Nacional, Eq.Guinea	9535
1700-1800		Radio Nacional Angola.....	7245, 9535
			11955
1700-1800		Radio Pyonyang, N. Korea....	7105, 7205
			7305, 9325
			9960, 9977
			11665
1700-1800		Radio Riyadh, Saudi Arabia..	9720v
1700-1800		Radio Tanzania.....	6105
1700-1800		Radio Zambia.....	9505
1700-1800		Voice of Africa, Egypt.....	15255
1700-1800		Voice of America.....	**15580, 15600**
			17800, 17870
1700-1800		Voice of Nigeria.....	11770
1700-1800		WCSN, Boston, Mass.....	**15270**
1700-1800		WHRI, Indiana.....	**15105**
1700-1800		WINB, Pennsylvania.....	15400
1700-1800		WMLK, Bethel, Pa.....	9455
1700-1800		WRNO Worldwide.....	**15420**
1700-1800		WYFR, Florida.....	**9535, 11580**
			11830, 11875
1715-1800		Radio Berlin International..	6080, 6115
1730-1755		BRT, Belgium.....	5910, 11985
1730-1800		Radio Australia.....	6035, 9580
1730-1800		Radio Bucharest, Romania....	7145, 9640
			9690, 11830
1730-1800		Radio Polonia.....	6135, 9540
1730-1800		Radio Portugal.....	11915, 13250
1730-1800		Radio Prague, Czechoslovkia	**5930, 7270**
			734, 9605
			9725, 11690
			11990, 15190
1730-1800		Radio Surinam.....	17755
1745-1800		BBC, London.....	**12095, 15070**
1745-1800		SLBC, Sri Lanka.....	11800

1800 UTC [2:00 PM EDT/11:00 AM PDT]

1800-1810		Voice of Kenya.....	6135
1800-1830		Radio Mozambique.....	3340, 9620
1800-1830		Radio Prague, Czechoslovakia	**5930, 7290**
			7345, 9605
			9725, 11690
			11990, 15190
1800-1830		Swiss Radio Int'l.....	9535
1800-1830		TWR, Monte Carlo.....	11965
1800-1900		Voice of Africa, Egypt.....	15255
1800-1830		Voice of Vietnam.....	9755, 9840
			12020, 12035
1800-1900		Deutsche Welle.....	7285, 9700
			9745, 11785
1800-1850		Radio Nacional do Brasil...	15265
1800-1900		4VEH, Haiti.....	4930
1800-1900		AFRTS.....	**15330,** 15345
			15430, 17765
1800-1900		All India Radio.....	11620, 11940
			15280
1800-1900		BBC, London.....	6180, 6195
			9410, 11820
			12095, 15070
			15275, 15400
1800-1900		CBC, N. Quebec Service.....	**9625, 11720**
1800-1900		CFCX, Montreal, Canada.....	6005
1800-1900		CFRX, Toronto, Canada.....	6070
1800-1900		CFVP, Calgary, Canada.....	6030
1800-1900		CKFX, Vancouver, Canada.....	6080
1800-1900		CKZU, Vancouver.....	6160
1800-1900		KCBI, Texas.....	**11735**
1800-1900		KNLS, Alaska.....	7355
1800-1900	M-F	KVOH, California.....	17775
1800-1900		KYOI, Saipan.....	9665
1800-1900		Radio Australia.....	5995, 6060
			6035, 6080
			7205, 7215
			9580
1800-1900	A,S	Radio Canada International.	**15260, 17820**
1800-1900		Radio Korea.....	5975, 15575
1800-1900		Radio Maputo, Mozambique....	9620
1800-1900		Radio Moscow.....	**11780, 11840**
			11850, 11860
			11950, **12030**
			13605
1800-1900		Radio Kuwait.....	**11675**
1800-1900	MWF	Radio Nacional, Eq.Guinea...	9553
1800-1900		Radio New Zealand Int'l....	11780, 15150
1800-1900		Radio Riyadh, Saudi Arabia..	9720v
1800-1900		Radio Tanzania.....	6105
1800-1900		Radio Zambia.....	9505
1800-1900		RAE, Argentina.....	15435
1800-1900		TWR, Swaziland.....	9550
1800-1900		Voice of America.....	**15580, 17800**
			17870, 25600
1800-1900		WCSN, Boston, Mass.....	**15395**
1800-1900		WHRI, Indiana.....	**15105**
1800-1900		WINB, Pennsylvania.....	15400
1800-1900		WMLK, Bethel, PA.....	**9455**
1800-1900		WRNO Worldwide.....	**15420**
1800-1900		WYFR.....	**9535, 11580**
			11830, 11875
1805-1830	A,S	Radio Austria Int'l.....	**9725, 12015**
1814-1817		Radio Suriname Int'l.....	17755
1815-1900		Radio Bangladesh.....	6240, 7295
			7505
1830-1855	M-A	BRT Brussels, Belgium.....	5910, **9905**
1830-1855		Radio Finland.....	**6120, 9610**
			11755
1830-1900		Radio Polonia.....	5995, 6135
			7125, 7285
			9525, 9675
			11840
1830-1900		Radio Sweden Int'l.....	**11845**
1830-1900		Radio Tirana.....	7065, 9480
1830-1900		Swiss Radio International...	6165, 9535
			9885, 11955
1830-1900		Radio Netherlands.....	9540, **17605**
			21685
1830-1900		Radio Sofia, Bulgaria.....	9700, 11720
1830-1900		Spanish Foreign Radio.....	7275, **9745**
			9765, **15375**
1830-1900		Radio Abidjan, Ivory Coast.	11940
1830-1900		Radio Havana Cuba.....	**11795**
1830-1900		Radio New Zealand.....	11780, 15150
1840-1900		Voice of Greece.....	11645, 12105
			15630
1845-1900		All India Radio.....	7412, 11620

1900 UTC [3:00 PM EDT/12:00 PM PDT]

1900-1915		Radio Bangladesh.....	6240, 7295
			9855, 11555
1900-1925		Radio Netherland.....	6020, 9540
			17605, 21685
1900-1925		Radio Prague,Czechoslovakia	**11610, 11655**
1900-1930		Kol Israel.....	**12077, 13725**
1900-1930		Radio Afghanistan, Kabul....	7160, 9530
1900-1930		Radio Berlin Int'l.....	**11750, 15170**
1900-1930		Radio Budapest Hungary.....	**9835, 11910**
			12000
1900-1930		Radio Japan.....	**11705**
1900-1930		Radio Kiev, Ukrainian SSR...	7230, 6010
			6090, 6165
1900-1930	S	Radio Norway Int'l.....	**9590, 11850**
			15225
1900-1930		Radio Yugoslavia.....	6100, 7240
			9620
1900-1930		Spanish Foreign Radio.....	**7275, 9745**
			9765, 15375
1900-1930		TWR, Monte Carlo.....	**11635**
1900-1930		Voice of Vietnam.....	9755, 9840
			12020, 12035
1900-2000		4VEH, Haiti.....	4930
1900-2000		AFRTS.....	**15330, 15430**
1900-2000		All India Radio.....	7150, 9665
			11620, 11845
			15265
1900-2000		BBC, London.....	**9410, 9515**
			12095, 15070
1900-2000		B.S. Kingdom Saudi Arabia..	**9720**
1900-2000		CBC Northern Quebec Serv....	**9625**
1900-2000		CFCX, Montreal, Canada.....	6005
1900-2000		CFRX, Toronto, Canada.....	6070
1900-2000		CFVP, Calgary, Canada.....	6030
1900-2000		CKFX, Vancouver, Canada.....	6080
1900-2000		CKZU, Vancouver, Canada.....	6160
1900-2000		HCJB, Ecuador.....	**15270, 17790**
1900-2000	S	KCBI, Texas.....	**11735**
1900-2000	M-F	KVOH, California.....	**17775**
1900-2000		Radio Algiers.....	9510, 9685
			15160, 17745
1900-2000		Radio Australia.....	6060, 6035
			6080, 7205
			7215, 9580
1900-2000		Radio Beijing.....	9860, 11500
1900-2000	TES	R. Discovery, Dominican Rep	15045
1900-2000		Radio Havana Cuba.....	**11795**
1900-2000		Radio Kuwait.....	**11675**
1900-2000		Radio Moscow.....	**9685, 9775**
			9880, **11780**
			11840, 11850
			11860
1900-2000	MWF	Radio Nacional,Eq.Guinea....	9553
1900-2000		Voice of America.....	**9760, 15205**
			15445, 15580
			17800, 17870
1900-2000		Voice of Nigeria.....	7255, 11770
1900-2000		WCSN, Boston, Mass.....	**15395**
1900-2000		WHRI, Indiana.....	**15105**
1900-2000	S,A	WINB, Red Lion, Penna.....	**15185**
1900-2000		WMLK, Bethel, PA.....	9455
1900-2000		WRNO Worldwide.....	**15420**
1900-2000		WYFR, Okeechobee, Florida..	**9535, 11875**
			15566, 21615
1910-1920		Radio Botswana.....	3355, 4820
1920-1930	M-A	Voice of Greece.....	9395, 9420
			9425
1930-2000		Radio Beijing, China.....	9440, 11515
			11905
1930-2000		Radio Bucharest, Romania....	7145, 9690
			9750, 11940
1930-2000		Radio Finland.....	6120, 11755
1930-2000		Voice of Islamic Rep. Iran..	9022
1935-1955		RAI, Italy.....	7275, 9710
1940-2000		Radio Ulan Bator Mongolia...	7235, 15305
1950-2000		Vatican Radio.....	**9645**

2000 UTC [4:00 PM EDT/1:00 PM PDT]

2000-2005		Radio Ghana.....	4915
2000-2005		Radio Ulan Bator Mongolia...	9575, 15305
2000-2010		Vatican Radio.....	6250, 7250
			9645
2000-2010		Voice of Kenya.....	4808
2000-2015	M-F	Radio Cotonou, Benin.....	4870
2000-2015		Radio Togo, Lome.....	3220, 5047
2000-2025		Radio Beijing, China.....	9440, **11515**
			11905
2000-2025		Radio Bucharest, Romania....	**9690, 11940**
2000-2025	M-H	Radio Polonia.....	7125, 7145
			9525, 9695
2000-2030		Radio Australia.....	**7205, 7215**
2000-2030		Radio Algiers, Algeria.....	17745
2000-2030		Radio Budapest, Hungary.....	6110, 7225
			9585, 9635
			11910
2000-2030	M-F	Radio Canada International.	**9555, 11945**
			15325, 17820
			17875
2000-2030	S	Radio Norway International..	**6015, 9655**
			15225
2000-2030		Voice of Islamic Rep. Iran..	**9022,** 11930
2000-2030		WRNO Worldwide.....	**15420**
2000-2045		All India Radio.....	7160, 9665
			9755, **9910**
			11620, 11865
20000-2050		Voice ofTurkey.....	7125
2000-2100		AFRTS.....	**15330, 15345**
			15430
2000-2100		BBC, London.....	**7325, 9410**
			9515, 12095
			15070, 15260
2000-2100		CBC Northern Quebec Service.	**9625, 11720**
2000-2100		CFCX, Montreal, Canada.....	6005
2000-2100		CFRX, Toronto, Canada.....	6070
2000-2100		CFVP, Calgary, Canada.....	6030
2000-2100		CHNX, Halifax, Canada.....	6130
2000-2100		CKFX, Vancouver, Canada.....	6080
2000-2100		CKZV, Canada.....	6160

frequency SECTION

2000-2100		King of Hope, Lebanon.....	6280
2000-2100		KVOH, California.....	**17775**
2000-2100		KYOI, Saipan.....	9670
2000-2100		Radio Baghdad, Iraq.....	**9875**
2000-2100	A,S	Radio Canada Int'l.....	**11945, 15325**
			17820, 17875
2000-2100		Radio Kuwait.....	**11675**
2000-2100		Radio Moscow.....	**9530, 9830**
			9880, 11780
			11840, 11860
			12030, 12050
			13605, 15425
2000-2100		R. Nacional, Equator Guinea	15106v
2000-2100		Radio New Zealand.....	11780, 15150
2000-2100		Radio Pyongyang, N. Korea...	6575, 7105
			9345, 9960
			9977
2000-2100		Radio Zambia.....	9505
2000-2100		Voice of America.....	**9760, 11760**
			15205, 15410
			15445, 15580
			17800, 17785
			17870
2000-2199		WCSN, Boston, Mass.....	**15390**
2000-2100		WHRI, Indiana.....	**15105**
2000-2100		WINB, Pennsylvania.....	**15185**
2000-2100		WRNO, Worldwide.....	**15420**
2000-2100		WYFR, Okeechobee, Florida..	**9535, 11875**
			15566, 17750
			21525
2005-2100		Radio Damascus Syria.....	**9950, 12085**
			15020
2010-2100		Radio Havana Cuba.....	**15230**
2015-2100		ELWA, Liberia.....	**11830**
2015-2100		Radio Cairo, Egypt.....	**9670**
2025-2045		RAI, Italy.....	7235, 5990
			11800
2030-2100		Falkland Islands Bcast Svc..	2373
2030-2100		IBRA Radio.....	**6110**
2030-2100		Radio Australia.....	9580, 9620
2030-2100		Radio Beijing.....	**11515**
2030-2100		Radio Netherland.....	**9540, 9715**
			9895, 11740
2030-2100	M-F	Radio Portugal.....	6170, 9740
2030-2100		Voice of Nigeria.....	11770
2030-2100		Radio Sofia, Bulgaria.....	**9700, 11750**
2030-2100		Spanish Foreign Radio.....	**7275, 9765**
2030-2100		Voice of Vietnam.....	9755, **9840**
			12020, 12035
2045-2100		All India Radio.....	7160, 9550
			9665, **9910**
			11620, 11870
2045-2100		Radio Berlin International.	6125
2045-2100		Vatican Radio.....	**9625, 11700**
			11760, 15120
2050-2025		Voice of Islamic Rep.,Iran..	9022

2100 UTC [5:00 PM EDT/2:00 PM PDT]

2100-2110		Vatican Radio.....	6200, 7250
			9645
2100-2115		Radio Cairo, Egypt.....	**9670**
2100-2115		Radio New Zealand Int'l....	11780, 15150
2100-2220		ELWA, Liberia.....	**11830**
2100-2125		BRT, Belgium.....	**9675**
2100-2125	S-F	CBC Northern Quebec Service.	**9625, 11720**
2100-2125		Radio Beijing.....	**11500, 11515**
2100-2125		Radio Netherland.....	**9715, 9895**
			11740
2100-2130		Radio Finland.....	**6120, 11945**
			15400
2100-2130		Radio Austria.....	**9585**
2100-2130		Radio Australia.....	**9620, 15160**
			15240, 15395
2100-2130		Radio Berlin International..	**6125**
2100-2130		Radio Japan General Service.	7280, 9695
			15195, 17755
2100-2130		Spanish Foreign Radio.....	7275, 9765
2100-2130		Swiss Radio Int'l.....	**9885, 12035**
			15570
2100-2140		Radio Havana Cuba.....	**15230**
2100-2145		WINB, Red Lion, Penna.....	**15185**
2100-2150		Deutsche Welle, West Germany	6010, **7130**
			9675, **9765**
			11815
2100-2150		Radio Pyongyang, N. Korea...	6575, 9360
			11660
2100-2156		Radio RSA.....	**5980, 7270**
			9585
2100-2200		AFRTS.....	**15330, 15345**
			15430
2100-2200		All India Radio.....	**9910, 11620**
2100-2200		BBC, London.....	**6005, 6175**
			6180, 7325
			9410, 12095
			15070, 15260
2100-2200		CFCX, Montreal, Canada.....	6005
2100-2200		CFRX, Toronto, Canada.....	6070
2100-2200		CFVP, Calgary, Canada.....	6030
2100-2200		CHNX, Halifax, Canada.....	6130
2100-2200		CKFX, Vancouver, Canada.....	6080
2100-2200		Equatorial Guinea.....	**9553**
2100-2200		Falkland Islands Bcast Svc..	2373
2100-2200		FEN, Tokyo.....	15260
2100-2200		King of Hope, Lebanon.....	6280
2100-2200		KSDA, Guam.....	7160, 11965
2100-2200		KVOH, California.....	**17775**
2100-2200		KYOI, Saipan.....	9670
2100-2200		Radio Baghdad, Iraq.....	**9875**
2100-2200	M-F	Radio Canada Int'l.....	**11960, 15325**
2100-2200v		Radio Jamahiriya, Libya.....	**7245**
2100-2200		Radio Moscow.....	**9490, 9865**
			9880, 11675
			11750, 11840
			11860, 11980
			12060, 13605
2100-2200	M-A	Radio Nacional Angola.....	9535, 7245
2100-2200	F,A	Radio Zambia.....	9505
2100-2200		RTL, Luxembourg.....	**6090**
2100-2200		Voice of Africa (Cairo)....	15375
2100-2200		Voice of America.....	**6040, 6045**
			9620, 9760
			11760, 15410
			15580, 17785
			17800, 17870
2100-2200		Voice of Asia.....	7445, 9845
2100-2200		WCSN, Boston, Mass.....	**15390**
2100-2200		WHRI, Indiana.....	**9770**
2100-2200		WRNO, Louisiana.....	**11705**
2100-2200		WYFR, Okeechobee, Florida..	**9535, 11830**
			17750, 21525
2105-2200		Radio Damascus, Syria.....	**9950, 12085**
2115-2230		Radio Yugoslavia.....	6100, 7240
			9620
2130-2200	T,F	BBC Falklands Service.....	**9915**, 11820
			12040, 15390
2130-2200	S-F	CBC Northern Quebec Service	**11720**
2130-2200		HCJB, Quito, Ecuador.....	**15270, 17790**
2130-2200		KGEI, San Francisco, CA....	**15280**
2130-2200		Kol Israel.....	**9010, 9435**
			11610, 13725
			15485
2130-2200		Radio Australia.....	15160, 15240
			15395, 17795
2130-2200		Radio Canada International.	11945, 15150
2130-2200		Radio Prague.....	**6055**
2130-2200		Radio Sofia, Bulgaria.....	**9700, 11720**
2130-2200		Swiss Radio Int'l.....	**6190**

2200 UTC [6:00 PM EDT/3:00 PM PDT]

2200-2215	M-F	Voice of America.....	**9640, 11740**
			15120
2200-2210		Radio Sierra Leone.....	5980
2205-2225		Vatican Radio.....	**9615, 11830**
2200-2225		RAI, Italy.....	**5990, 9710**
2200-2230		All India Radio.....	7160, 9550
			9665, **9910**
			11620
2200-2230	S-F	CBC Northern Quebec Service	9625, 11720
2200-2245		Radio Berlin Int'l.....	**6165, 6125**
			11750
2200-2230		Radio Canada International..	**5960, 9755**
2200-2230	S	Radio Norway International.	**9585, 9610**
2200-2230		Radio Sofia, Bulgaria.....	**9700, 11720**
2200-2230		WRNO Worldwide.....	**11705**
2200-2300		AFRTS.....	**6030, 15345**
			15430
2200-2300		BBC, London.....	**5975, 6005**
			6120, 6175
			6180, 7325
			9410, 9515
			9590, 9915
			12095, 15070
2200-2300		CFCX, Montreal, Canada.....	6005
2200-2300		CFRX, Toronto, Canada.....	6070
2200-2300		CFVP, Calgary, Canada.....	6030
2200-2300		CHNX, Halifax, Canada.....	6130
2200-2300		CKFX, Vancouver, Canada.....	6080
2200-2300		CKZU, Vancouver.....	6160
2200-2300		Falkland Islands Bcast Svc..	2373
2200-2300		King of Hope, Lebanon.....	6280
2200-2300		KVOH, California.....	17775
2200-2300		KYOI, Saipan.....	**15405**
2200-2300		Radio Australia.....	15160, 15240
			15320, 15395
			17795
2200-2300		Radio Moscow.....	**7195, 9685**
			9720, 9865
			9880, 11710
			11750, 11850
			12060, 13605
			15425
2200-2300		Radio Moscow World Service	**9490, 120**
2200-2300		Radio Pyongyang, N.Korea...	11735
2200-2300		R. Vilnius, Lithuanian SSR..	**7260, 96**
			11875, 136
2200-2300		Voice of America.....	**15290**
2200-2300		Voice of Free China, Taiwan	**15440, 178**
			9955
2200-2300		Voice of Turkey.....	**9505, 95**
			17760
2200-2300		WCSN, Boston, Mass.....	**15300**
2200-2300		WHRI, Indiana.....	**9770**
2200-2300		WRNO Worldwide.....	**11705**
2200-2300		WYFR, Florida.....	**9535, 118**
			21525
2230-2300	S	CBC Northern Quebec Service.	**9625, 117**
2230-2300		Radio Korea, South.....	**15575**
2230-2300		WRNO Worldwide.....	**9852.5**
2245-2300		All India Radio.....	6035, 72
			9595, **99**
			11765
2245-2300		GBC1 Ghana.....	4915

2300 UTC [7:00 PM EDT/4:00 PM PDT]

2300-2330		BBC, London.....	**5975, 60**
			6120, 61
			6180, 61
			7325, 94
			9590, 99
			9515, 120
			15395
2300-2330		Kol Israel.....	**9435, 98**
			11610
2300-2330		Radio Canada International..	**9755, 117**
2300-2330		Radio Korea, South.....	**15575**
2300-2330		Radio Sweden International..	**9695, 117**
2300-2345		Radio Berlin International..	**9730**
2300-0000		AFRTS.....	**6030, 153**
2300-0000	A,S	CBC Northern Quebec Service.	**6195, 96**
2300-0000		CFCX, Montreal, Canada.....	6005
2300-0000		CFRX, Toronto, Canada.....	6070
2300-0000		CFVP, Calgary, Canada.....	6030
2300-0000		CHNX, Halifax, Canada.....	6130
2300-0000		CKFX, Vancouver, Canada.....	6080
2300-0000		CKZU, Vancouver.....	6160
2300-0000		Falkland Islands Bcast Svc..	2373
2300-0000		FEBC, Manila.....	15320
2300-0000		KVOH, California.....	**17775**
2300-0000		KYOI, Saipan.....	**15405**
2300-0000		Radio Australia.....	**15160, 152**
			15320, 153
			17795
2300-0000		Radio Japan.....	9695, **118**
			15195, 152
			15300
2300-0000		Radio Moscow, U.S.S.R.....	**9530, 96**
			9720, 97
			9865, 98
			11710, 117
			12060, 136
			15425
2300-0000		Radio Moscow World Service	**12000, 178**
2300-0000		Radio Sofia Bulgaria.....	**9700, 117**
2300-0000		Radio Pyongyang, N. Korea..	11735, 136
2300-0000		Radio Thailand.....	9650, 119
2300-0000		RTL, Luxembourg.....	6090
2300-0000		Spanish Foreign Radio.....	6020
2300-0000		Voice of America.....	9640, 117
			15160, 151
			15290, 177
			17740, 178
2300-0000		WCSN, Boston, Mass.....	**15300**
2300-0000		WHRI, Indiana.....	11770
2300-0000		WRNO Worldwide.....	**9852.5**
2300-0000		WYFR, Florida.....	9680, **115**
			11855, 151
			15440
2330-2355		BRT Belgium.....	**9790**, 992
2330-0000		BBC, London.....	**5975, 60**
			6120, 61
			7325, 94
			9515, 95
			9915
2330-0000	S-F	Radio Canada International..	**5960, 97**
2330-0000		Radio Kiev, Ukrainian SSR...	**7260, 96**
			13645
2330-0000		Radio Tirana.....	**7065**
2330-0000	TES	Radio Veritas,Philippines...	9740
2330-0000		Voice of Vietnam.....	9765, 984
			12020, 120
2330-0000		Voice of Nicaragua.....	6015
2330-0000		WINB, Pennsylvania.....	15145
2345-0030		Radio Berlin Intl.....	**6080, 97**

YEMEN: The North and South of it

by Terry Fielding, NdB

There was a study done some time ago that showed something like 39 out of 100 teenagers thought Brasil was in Africa. Worse yet, 17 of them couldn't tell what ocean washes the U.S. west coast.

Shortwave listeners would score vastly higher on this kind of test. They pride themselves on their knowledge of where things are on the world map.

But even a diligent shortwave listener might be forgiven if he momentarily pauses to think about Yemen -- and wonder about the difference between North and South. San'a is the capital of North... or is it South. And, yes, one *is* communist and the other is ... not? One *is* the Yemen Arab Republic and the other is the People's Democratic Republic of Yemen.

The case of the two Yemens may tend to be even more confusing because the radio stations are not well heard in North America. And neither airs any English programming. So these are not sources that immediately pop to mind when we want the latest news about Yemen. Or the Middle East for that matter.

Yemen - one of the most unusual, under-reported, volatile and truly mysterious countries in the world! Terry Fielding grants a glimpse behind a few of her veils.

Insofar as shortwave listeners are concerned, the two Yemens offer two potential additions to the log sheets and little else. They are reception challenges that are not soon forgotten.

Which makes this background briefing on the two countries and their radios perhaps more advisable than some other features of this kind.

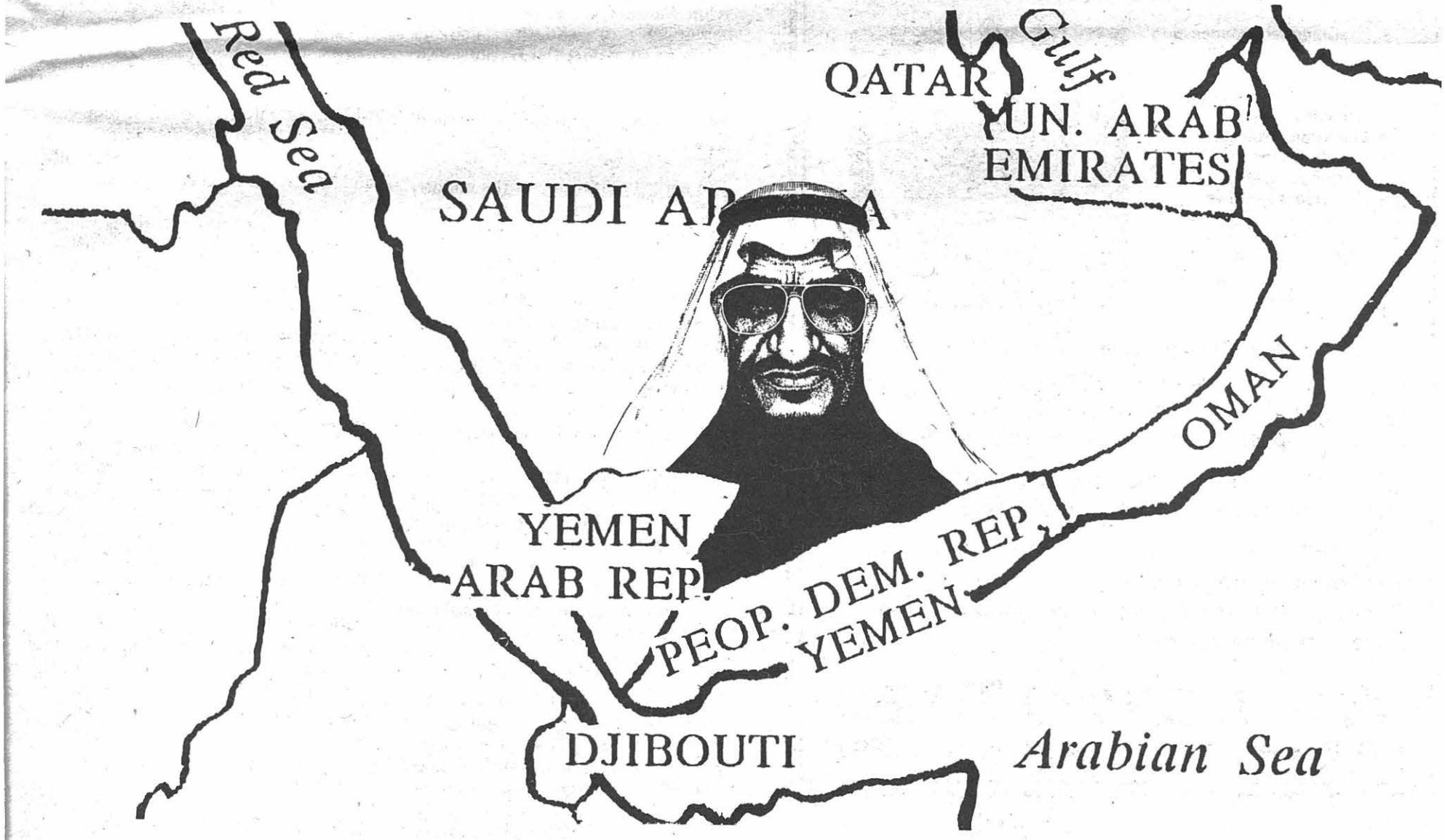
NORTH YEMEN

So. San'a is the capital of North Yemen. Which is the Yemen Arab Republic. And is the non-communist half of the duo. What is today North Yemen was once the largest segment of the ancient kingdom of Sheba and even before that, the Minaean Kingdom (circa 1200-650 BC). It has, over the centuries, been ruled or influenced by all manner of countries and sects, a process which included the introduction of Islam in the 7th century.

The last outsiders, the Turks, left in 1918 when the area at last achieved independence. Treaties were signed with Saudi Arabia which promised to recognize Yemen's borders and the Imam as the Yemeni King.

The King was assassinated in 1962 after which a republic was established by anti-Royalist elements. The Imam's heir fled into the mountains where, supported by the local tribes and the Saudis, he fought a civil war against the new government and its Egyptian supporters. The war ended in 1970 with the royalists still on the outs but at least holding many positions within the government.

There is little in the way of what most would consider political parties active in the Yemen Arab Republic. The constitution has been suspended and day to day politics are largely the business of local tribes. The central government rules largely by granting



YEMEN
continued from p.39

fiefs to local tribal rulers. Courts are mainly local and run along tribal or Islamic lines. As one writer put it, outside of San'a, Yemen is "more or less in the 14th century."

Many of the 6 million population work outside the country, particularly in Saudi Arabia, which, through those lost wages as well as via direct government-to-government aid, accounts for a large portion of the entire national income.

The republic is largely a mountainous area said to contain the purest of Arab bloodlines.

The station from North Yemen is Radio San'a, which is operated as a division of the state's Ministry of Information. Three frequencies are listed for operation on shortwave: 4853 and 6135 kHz -- both using 20 kilowatt transmitters -- and 9780 with 100 kW.

4853 is heard only rarely; 6135 virtually never. 9780, however, is heard with a fair degree of regularity. Sign on is at 0300 and the programs run until 0700 UTC then activity resumes at 1000 UTC and runs until 2115. On Fridays, operations are continuous from 0300 to 2115.

The prime opportunities for North American reception are at the 0300 sign on (on 9780 kHz) and again, especially in the east and midwest, to 2115 sign off. Programming is entirely in Arabic.

QSLs often require three or four attempts but most correct reports will eventually be answered by form letter. The station's address is simply Radio San'a, Ministry of Information, San'a, Yemen Arab Republic.

SOUTH YEMEN

Southward is, not unexpectedly, South Yemen. The capital, Aden. The People's Democratic Republic of Yemen. Communist, with a Khadaffi-like proclivity for meddling in the affairs of its neighbors.

The British took the South Yemen capital of Aden in 1839, establishing a British protectorate there by the early 20th century. Aden eventually grew into a large and strategically important naval base. By 1965, however, several leftist revolutionary groups had emerged and fighting between them over the next couple of years left the country in chaos by the time the British pulled up anchor and sailed away in 1967.

In the absence of the British, a socialist/communist National Liberation Front took control, only to be replaced by an even more radical communist NLF contingent two years later. That date marked the beginning of South Yemen's attempts to export the revolution to Saudi Arabia. Things got so rough, in fact, that toward 1973, the two sides were actually fighting inside Saudi Arabia.

The early 1970s also saw the country playing host to several guerilla terrorist groups and establishing training camps for them, including the PLO and the more radical Popular Front for the Liberation of Palestine. During the same period, the government was also trying to overthrow the government of Oman, supporting the Dhofar rebellion and hosting an Omani government in exile. Busy beavers, they were.

In 1979, a friendship treaty was signed with the USSR which provided for Moscow's use of the Aden naval base. South Yemeni troops operate alongside those of East Germany and Cuba, in such operations as the Eritrean resistance in Ethiopia.

The two Marxist factions in South Yemen still have not settled their differences and have clashed several times in recent years, including last year's flare-up in which no one knew who was in charge for several days.

South Yemen's population is about 1.8 million. The capital has a large African and Indian population and a strong labor union movement.

The Aden government maintains a leftist "National Democratic Front" organization which has the sole purpose of opposing the government in San'a. There have been numerous skirmishes and mini wars along the border of the two nations over the years. Despite that, however, there have also been several instances where talks have been held looking toward the eventual reunification. The north does not want any part of a communist government and negotiators have been unable to get past that rather major sticking point.

The Democratic Yemen Broadcasting Service (DYBC) is the official South Yemen government radio. It runs under the auspices of the State Committee for Information and 100 kilowatt transmitters are listed for operation on 5970 and 11950 kHz with a two part schedule from 0300 to 0600 and again from 1100 to 2100. Like San'a, Fridays go straight through, from 0300 to 2100. Programs are in Arabic.

The 5970 kHz frequency is known to be active. 7190 is also active as is 11770, the latter probably a replacement for 11950 kHz. All three have been heard up to the 2100 sign off and at the 0300 UTC sign on.

One cautionary note: at times there is a Soviet station on 7190 after 0300. It also broadcasts in Arabic so extra care is advised here.

Verifications from DYBS are about at the same difficulty level as those from the North. You can reasonably expect to have to make three or four attempts or you can as easily luck out and get a reply on the first try. It isn't necessary for either station to send your report in Arabic. English reports seem to be perfectly acceptable. The address for reports on DYBS is P.O. Box 1222. Aden, People's Democratic Republic.

And good luck. Listen to either of these stations and you'll have made contact with one of the most unusual, under-reported, volatile and truly mysterious countries in the world.

■

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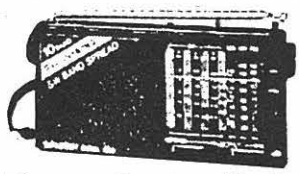

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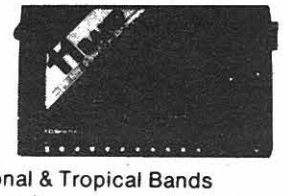

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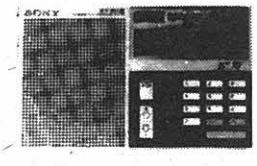

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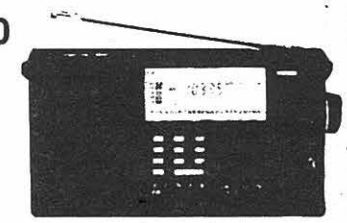

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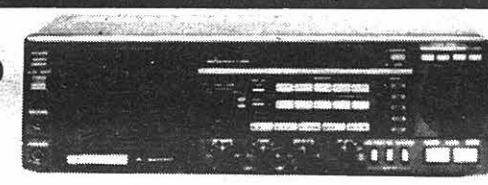

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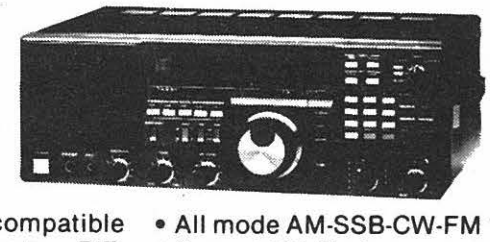

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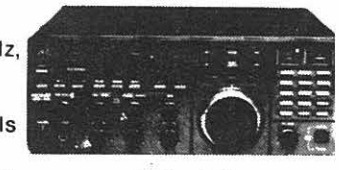

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Paul Swearingen
P.O. Box 4812
Panorama City, CA 91412

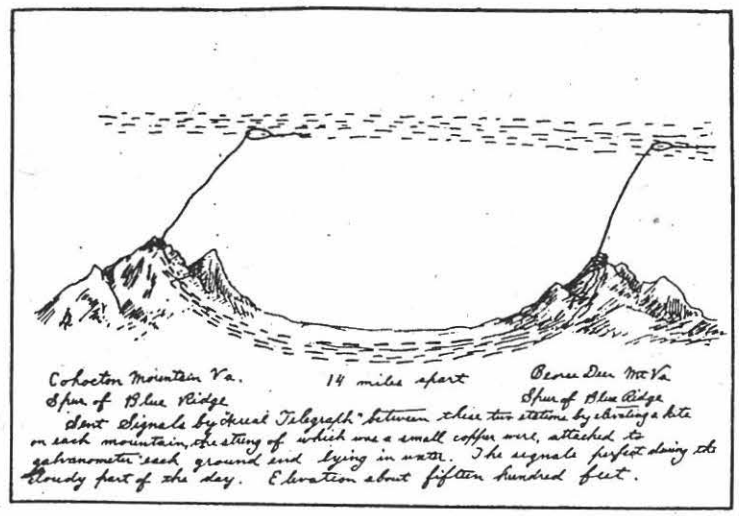
Paul Swearingen is taking the month off, but will return with the October issue.

Who Said Marconi Invented Wireless?

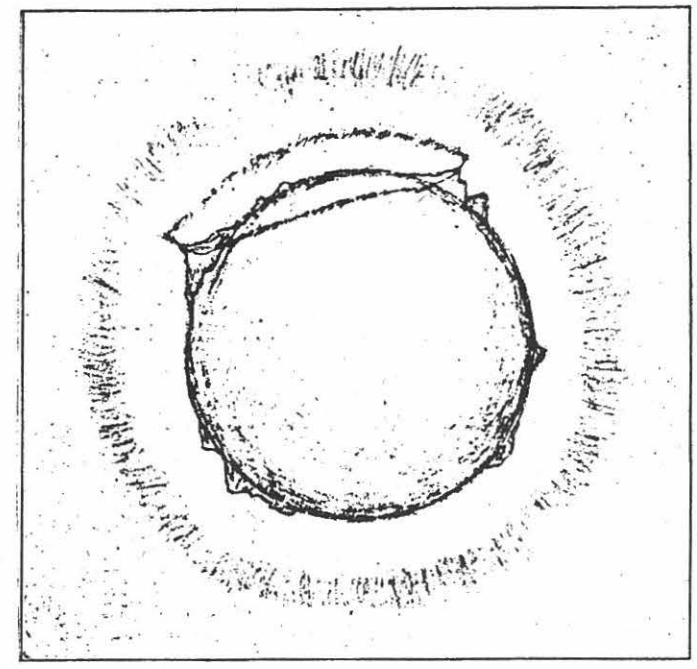
by D.K. deNeuf, WA1SPM

Marconi never made such a claim. He said he only took the discoveries made by Hertz, Righi, Branly, and others years before and forged them into a workable practical means of communication without wires. Yet many school and other books credit him with this feat.* He was granted a British patent in 1896 for an invention for "improvements in transmitting electrical impulses and signals."

Marconi probably never heard of an American Patent (#129,971) issued in 1872 to Dr. Mahon Loomis, a Philadelphia dentist, for "a system of aerial telegraphy" (Dr. Loomis also held both U.S. and British patents on the "kaolin" process for making dentures).



The First Antenna: Reproduction from Loomis's sketch, 1865



Reproduction of a drawing made in 1865 by Loomis, showing his idea of how setting up "disturbances in the atmosphere" would cause electric waves to travel through the atmosphere and the ground, thus establishing wireless telegraph communication between two distant points. The aura around the earth represents what he termed the "static sea."

And Marconi probably never saw the *Washington Chronicle* newspaper issue of Nov. 1, 1872, which reported show Loomis had conducted his experiments with fine light copper gauze kites. A sketch drawn by him in 1865 depicted his kites being flown from two mountaintops in Virginia (see sketch).

Each kite was tethered with a copper wire "attached to a galvanometer, each end lying in water." His caption says, "the signals were perfect during the cloudy part of the day."

The essential part of the patent issued to Loomis indicated "...the utilization of natural electricity... relying upon the disturbance produced in the two electro-opposite bodies of earth and atmosphere." (Ben Franklin's famous kite experiments were carried out in 1752 resulting in sparks jumping from the key attached to the tether during lightning storms.)

Congress, on May 21, 1872, listened to a long speech relative to the "Loomis Aerial Telegraph Bill" requesting an appropriation of $50,000. Just how Dr. Loomis proposed to send telegraph signals or messages and to receive them never seemed to be fully explained.

** One of the world's greatest inventors apparently thought so, too. Note his comment written in his unmistakable "telegraphic script":*

I have great admiration and high regard for Marconi the pioneer inventor of Wireless Telegraphic Communication
Thos A. Edison

It is said Loomis died in 1866 of a broken heart over his nation's failure to recognize him.

We generally think we can't transmit DC through the air without wire. But hold on--if you connect a sensitive DC galvanometer between an antenna and ground you'll see deflection from lightning flashes. Now if the impulse striking the antenna as a result of a distant discharge were AC the galvanometer should read zero; i.e., no net reaction to opposing half cycles. But that is not the case.

Dick Hilferty, W5TOS, has proven that each flash produces either a positive or negative indication - but not both and not zero.

A well-elevated antenna like a kite can accumulate rather large voltages; the normal gradient is said to be about 33 volts per foot above the earth.

Could Loomis have been setting up scratchy discharges just by grounding and ungrounding the "transmitting antenna" which were detected by a DC instrument? One of Loomis' drawings in 1865 showed his idea of how setting up "disturbances in the atmosphere" would "cause electric waves to travel through the atmosphere and the ground...thus establishing wireless communications between two distant points."

Apparently Loomis did not actually transmit and receive (detect) electromagnetic waves. Eduoard Branly invented the "coherer" - the first detector of any kind to respond to wireless waves - but this was not until 1890.

The coherer, a glass tube containing a fine metal powder, operated on the principle that while many powdered metals behave as poor conductors to DC voltages they have a relatively high conductivity at high frequency voltages. When electromagnetic waves passed through the powder, the microscopic sparks bridged the interstices (gaps) thus causing the particles to adhere to each other. The powder could then be restored to its original loose state by tapping or vibrating the glass container.

Congress denied the Loomis appropriation request, allegedly calling the whole idea "absurd." ■

This book is dedicated to the memory of Dr. Mahlon Loomis, who, in 1865, sent the first aerial telegraph messages.

A word from Dr. Rogers.

"It was my pleasure to know Dr. Loomis in the early days when he was trying to convince a skeptical world of his new and wonderful discovery. So impressed was I that I went to see Professor Joseph Henry, then at the Smithsonian Institution, and unfolded to him Dr. Loomis' plans. *Time has vindicated this great pioneer in the art of wireless communication.*

Very sincerely yours,
J. Harris Rogers,
Hyattsville, Md.,
July 13th, 1920."

Was this the same Dr. Rogers who invented the Rogers Underground Antenna circa 1920?

Dr. Mahlon Loomis

Dr. John Santosuosso
P.O.Box 1116
Highland City, FL 33846

Scott McClellan
P.O. Box 982
Battle Creek, MI 49016

Dr. Santosuosso Returns ...

and so does Havana Moon!

It is good to be back after spending some very pleasant time in Europe. More about that later, but first here are a few clandestine items.

Several months ago we recommended keeping an ear tuned to Radio Caiman, which puts out the strongest signal of any clandestine. We still think that is a good idea, but you will probably find them on 9960 rather than the old 7470. Look for them mornings and evenings.

It was almost inevitable that a Guatemalan clandestine would eventually turn up. The country has been faced with insurgency movements for years. Look for a station by the name of Voz Popular on 6950. This one may not be very easy to hear.

John Demmitt of Pennsylvania furnishes us some interesting information about Miami-based Radio Mambi on 710 kHz. This anti-Castro broadcaster recently found itself in the peculiar position of having the FCC reject its application to reduce its night time power from 50,000 to 25,000 watts. The station is thus forced to run excess power it does not need or want. Is the FCC trying to jam a frequency the Cubans already jammed by placing a Radio Reloj transmitter on 710?

From Texas, Dave Larson writes that the unknown clandestine log reported by Matt Varick on 6610 in the June column is anti-El Salvador government Radio Farabundo Marti. You will find programming on this similar to that of Radio Venceremos, although it is less active and reported less often.

Report from the Emerald Isle: If you have not yet logged and verified unlicensed Radio Dublin on 6910, time may be running out. Ireland was one country I recently visited. While in the Dublin area I was told that as many as twenty commercial pirates are currently operating, but by October they could all be gone.

Rumors of government legislation to shut down the Irish pirates are nothing new. However, this time the situation does look more serious. Part of the problem is the irresponsible behavior of the stations themselves. In March, the authorities raided one of the facilities of Boyneside Radio, which operates in several communities. Word has it a competitor encouraged the government to act, falsely claiming the station was causing interference. Because of this raid, station personnel are somewhat paranoid, and it was impossible to visit the studios of any of them.

At present time there is still plenty to be heard on the medium wave and FM bands as you travel about the country. Although I had little free time to monitor the bands, I managed to tune in several pirates in the Dublin area including Sunshine Radio (531 kHz), Radio Dublin (1188), BLB Community Radio (657), and Energy 103 (103 MHz). In Cork, WBEN (98 MHz) was logged, while Limerick's Sound Channel (97.7) was heard in that city.

All these were logged on a small pocket radio. When you travel to a foreign country, or even a different part of your own, take advantage of the situation to hear something different. You do not have to haul a lot of expensive equipment along.

And if you are not traveling to Ireland, there is still time to hear Radio Dublin on shortwave. It is on 6910, 24 hours a day, and can be heard throughout the year in the Eastern United States if conditions are right. It has made it through all the way to the West Coast on occasion. The station is a good verifier. Reports go to 5B Inchicore Road, Kilainham, Dublin 8, Ireland, but play it safe. Don't wait too long. Speaking of pirates, it's time to hear from Scott.

The McClellan Report:

It appears as though an effort is being made to get U.S. pirate stations to move away from the overcrowded 41-meter band, in favor of the area just above the 90-meter tropical band. Radio North Coast International is sending letters to various stations urging them to give the range between 3400-3500 a try. Test transmissions on this band have produced excellent results. So far, KROK and Zepplin Radio Worldwide are joining RNCI in moving most of their transmissions to this band. Keep an ear open!

Scott also sent along an interesting report on the English offshore pirate station. We will have to hold that until next month. At that time, I will also report on what I managed to hear on some of these stations during my recent trip.

And now...

The Return of Havana Moon

by Havana Moon: I'm back! That roar of approval (?) is just what I expected. It's so darned nice to know that so many of you missed (?) my column and welcome (?) it back.

And why did it stop in the first place? Well that's not an embarrassing question to answer. Let's just say that other commitments were catching up with me. Were they ever!

During my hiatus, I've marked a number of milestones. Most notable is my book on numbers stations, *Unio, Dos, Cuatro* (Tiear Publications). It's available from Imprime, Box 241, Radnor Station, Radnor, PA 19087, as well as several other *Monitoring Times* advertisers. Get the hint? Buy the book!

And if you are new to *Monitoring Times*, I'm the guy shrouded in black wearing a fedora that used to do a column entitled "Los Numeros." I wrote a lot about "numbers" transmissions and other things that go bump-in-the-night. I also--at times--managed to offend U.S. Government agencies, a few readers, and one foreign government that shall remain nameless.

And all it takes to be included in this column is for you to forward your intercepts, comments, or whatever to Havana Moon in care of *Monitoring Times*. Nothing could be easier. Nothing that is--except hearing a "numbers" transmission. I understand, however, that there are many of you that have never heard a numbers transmission! I find that very strange. But in future columns I'll tell you the best frequencies, times and many other things about "numbers" transmissions in non-technical language.

I'm a former member of the intelligence community and and have been involved in communications activities for almost more years than I care to remember. And if you think I'm going to discuss my former days as a "spook"--forget it. Suffice it to say I was not Director of NSA! I was also not night porter at the KGB outpost in Managua as has been suggested! Try somewhere in between. Maybe it was night porter at PTL.

As there is a *Monitoring Times* team, so there is a Havana Moon team. I've often been derelict in my duties by not giving the Havana Moon team proper credit for their very able assistance and friendship. They play a very important part in this column. There's Detective Lieutenant John Fuard and the nearly famous Eric Conners. Eric is the guy who's a first class pro when it comes to the ins-and-outs of governments.

And there's a new Havana Moon team member, and she's a somewhat mysterious member. Her name is Diane H. Diane, for some strange reason, and had the audacity to be born in Alaska; however, she now calls Pennsylvania home. Diane is a most methodical research expert. She's also, of all things, a Ouija specialist and likes "silent flowers!" Now, if Diane would only tell her story...

Hot "Numbers" Frequency List: 3090 kHz, 3120, 3125, 3130, 3690. Some, but not all, "numbers" transmissions on the above frequency do originate from downtown Havana! Repeat frequency for the above is 4030 kHz at 30 past the hour. 3445, 4030, 4445, 4670, 4780. The above is a very important frequency to watch. It is a FEMA (Mt. Weather) frequency. FEMA--for reasons known only to FEMA--does not like to talk about "numbers"transmissions. 4825, 5060, 5080, 5090, 5135. Note that 5134.5 is a discrete FEMA frequency! 5810, 6802, 6825, 6835, 6840, 7404, 7527. The above frequency is but another curious "numbers" frequency. Seems that "numbers" transmissions literally forced U.S. Customs to abandon this frequency.

And speaking of Mt. Weather and FEMA, be sure to pick up a copy of William Poundstones's *Bigger Secrets* (Houghton Mifflin). Be sure to read every word in chapter nine. Poundstone, as only Poundstone can, reveals a lot of things about Mt. Weather that FEMA would just as soon you not know.

I'm not really sure if I'm allowed to mention Tecate or not in this column. But what the heck. And time now for a Tecate and...Adios, from Havana Moon y Amigas

That's it from the Outer Limits team. See you in 30. ■

Lawrence Magne

Editor-in-Chief
Radio Database International

The Sony ICF-PRO80

A Scanner That Doubles as A World Band Radio

Most advanced-technology radios are specialty products designed to do one thing well: bring in the world by radio. Some also excel at receiving FM broadcasts, and yet others succeed at receiving specialized radio signals -- ships at sea and the like.

Sony's new ICF-PRO80, however, is designed to do all of these and more. With this $419.95 portable, you can tune in all manner of police, fire and aircraft communications, along with such arcane chitchat as the back-and-forth of security agents. In short, this is what's referred to as a "hand-held scanner". And it's a pretty sharp-looking one, at that. Hold one in your hand and you can easily picture yourself directing dozens of hooks and ladders at a seven-alarm blaze.

Few World Band Features

What makes Sony's scanner different is that it also picks up world band broadcasts. However, the PRO80 lacks many of the features found on competing world band portables. There's no tuning knob, no signal strength indicator, no clock and no timer or sleep control. If you want to receive single sideband signals, you have to settle for just that: single sideband. There's no way to separate lower from upper sideband as there is on better world band radios. And the excellent synchronous detector found on Sony's less-costly ICF-2010/ICF-2001D portable is missing here.

Too, the PRO80 tunes only in 5 kHz increments. There's a supplementary fine tuning control, just as on the Sony ICF-2003/ICF7600DS that costs half as much. Also like the '2003, the PRO80 has a set of up/down slewing buttons for bandscanning. In addition to the keypad, there are no less than 40 memories (four banks, ten channels each) to store your favorite stations.

Mixed Performance

World band performance varies from the mediocre to the outstanding. On one hand, the PRO80 is stable, so it doesn't need retuning from time-to-time. Additionally, it's sensitive throughout the world band spectrum, so even weak stations tend to be heard. Its dynamic range is superior for a portable, too, so it's likely to function nicely even in such high-signal-strength parts of the world as Europe and North Africa.

Hold a PRO80 in your hand and you can easily picture yourself directing dozens of hooks and ladders at a seven-alarm blaze.

Selectivity, however, is a mixed bag. On one hand, ultimate selectivity is remarkable for a portable -- or even a costly tabletop communications receiver. Too, there are fully three bandwidths, two of which are useful for listening to world band broadcasts. These bandwidths are well chosen. However, skirt selectivity is inferior to that found on less-costly Sony portables, such as the ICF2010/ICF-2001D.

At the other end of the quality scale, spurious signal rejection is mediocre. As a result, unwanted signals tend to pop up in various parts of the world radio bands where they don't belong. The problem with this is that these "repeats" can cause unnecessary interference to stations you are trying to hear.

Modest Audio Quality

The PRO80 might be OK if it stopped here, but its audio quality -- because of moderately high distortion and a tiny speaker -- is mediocre. Listening to chitchat from the local fire house with this device is one thing, but trying to enjoy a clear broadcast from, say, France with the PRO80 requires some degree of aural forbearance.

Mixed Ergonomics

The major ergonomic characteristic is that the PRO80's role as a hand-held scanner has resulted in a set that is unusually complicated to operate. For example, its keypad tuning scheme requires more button-pushing than do those of most other portables. And changing bandwidth calls for pushing two buttons (rather than the usual one) simultaneously.

The volume control is shared with the two-step tone control, and it's located right next to the screw-on telescopic antenna. As a result, this often-used control is awkward to operate, especially when the button control is depressed to the "low" tone position.

All ergonomic characteristics aren't negative, however; the PRO80 comes equipped with an easy-to-use display light that fades out automatically after several seconds. This makes nighttime listening much handier than on such unilluminated portables as the Sony ICF-7700/ICF-7600DA.

In short, the Sony ICF-PRO80 occupies a niche for scanner buffs who wish to have a handheld portable that also brings in world band broadcasts. Also, "DXer's" who find the '2010 too large and heavy may find the PRO80 useful on trips.

You can hear Larry Magne's equipment reviews, along with reports from Radio Database International's Don Jensen and Tony Jones, the first Saturday night each month over Radio Canada International's "SWL Digest" at 8:10 PM Eastern time on 5960 and 9755 kHz. Larry's "What's New in Equipment" is also featured over "SWL Digest" various other Saturdays throughout the month.

In the U.S., RDI White Papers are carried by Electronic Equipment Bank, Imprime and Universal Shortwave. A free catalogue of the latest editions of all available RDI White Papers, including those covering the best in communications receivers and antennas, may be obtained by sending a self-addressed stamped envelope to Publications Information, Radio Database International, Box 300, Penn's Park, PA 18943 USA.

The Sony PRO80 at VHF

by Bob Grove

The new Sony PRO80 is a paradox: Is it a shortwave portable or a VHF hand-held scanner? It cannot be used for both at the same time, and even the converted VHF range cannot be scanned continuously--a switch must be thrown to select between two frequency ranges.

Dedicated radios for either shortwave or VHF/UHF scanning are infinitely easier to use, probably smaller, and cost less for better performance. For example, on a Bearcat 100XLT scanner to listen to a new frequency, you press "MANUAL", the frequency, and "ENTER".

But on the PRO80 you first must remove the battery cartridge and flip a switch to change the readout range, then reinsert the battery cartridge; then you remove the whip, attach the converter, put the whip back on, press "PROGRAM" and "DIRECT" simultaneously, then enter "115.000", press "EXECUTE", press "DIRECT", enter the frequency, and press "EXECUTE".

The laborious procedure must be repeated each time the user wants to switch from shortwave to converted VHF monitoring. Scanning from the memory channels on shortwave, frequencies between 115 and 174 MHz, and frequencies between 174-223 MHz at the same time is not possible; nor is it possible to memorize SSB mode (only AM and FM), or frequencies in less than 5 kilohertz increments.

On the Plus Side

The PRO80 is function-rich, allowing considerable variance in individual listening tastes. Shortwave DXers, broadcast listeners, utilities buffs, scanner monitors--all classes will have fun with the little radio.

The telescopic whip antenna for shortwave and VHF reception may be removed and a BNC adaptor (supplied) attached for use with an external antenna. Reception below 1600 kHz is accomplished through an internal ferrite rod loop antenna.

Sensitivity is excellent, SSB reception is rock stable, scan/search speed is adequate (about 8 increments per second), and quality of construction and cosmetic appearance is typically Sony--plastic but professional.

Frequencies may be stored in the 40 memory channels individually as FM or AM (wide or narrow selectivity), but not SSB. The radio comes with a shoulder strap and case; batteries (4 AAs are required) and AC adaptor are optional.

The Bottom Line

The Sony PRO80 may be succinctly described as cumbersome but competent. So who will buy the Sony PRO80? Anyone who wants compact portability coupled with good performance covering the widest MF/HF/VHF frequency range presently on the market.

While the Sony ICF2010 will give better world band performance, and a dedicated hand-held scanner will give better VHF (and add UHF) performance, the piecemeal approach will cost well over $500. Grove Enterprises is listing the unit at an introductory discount price of only $329 (plus $5 shipping); it is also available from other *MT* advertisers.

Delivery date for the PRO80 in the United States has been delayed; September is the earliest likely at this writing.

COMING NEXT MONTH

Mike Mitchell reviews the AEA PK232 multi-mode demodulator. Don Jensen previews the shortwave bands ... not just for October, but until the end of the century. Who is likely to be signing on? Who will be leaving? What will the radios be like? America's elder statesman of shortwave reports.

GTI Preamplifier

Most VHF/UHF receivers and scanners can use a boost in the sensitivity department. While additional gain is not usually necessary, an external low-noise-figure stage can accomplish wonders.

The new 1000P preamplifier from GTI is an effective package featuring good gain, low noise figure and excellent strong-signal-overload immunity. It is housed in a substantial diecast box and outfitted with BNC connectors. It is powered by 12 to 15 volts DC at approximately 60 mA (available from the Spectra-Display if used with that accessory).

The interior circuitry is nicely laid out around two GaAsFETs and features positive feedback to encourage high gain right through 1000 MHz. The input is protected against destruction by accidental high signal overload or nearby lightning strokes by a gas discharge device.

GTI 's 1000P preamplifier substantially improves signals above 500 MHz

GTI PREAMP
continued from p.45

The gain of our evaluation unit showed 18.5 dB at 3 MHz, 23.0 dB at 10 MHz, 21 dB from about 100-900 MHz, and was still 18 dB at 1100 MHz. Its noise figure averaged 4 dB throughout the VHF/UHF land mobile frequency ranges.

Perhaps most important, especially to those listeners in metropolitan areas, is the compression point, the level of an incoming signal which will drive the gain of the amplifier down 1 dB--greater than 10 dBm in the 1000P.

Third order intercept, a figure used to express immunity from producing "intermod" (intermodulation), is a healthy 30 dBm at VHF, equivalent to that found in the most expensive receivers, and decreasing only 3 dB at 800 MHz.

A Comparison

It was too much of a temptation to resist; how would this premium $150 preamplifier compare with the popular $39 Grove PRE-3 Power Ant? The two preamps were repetitively switched between a Grove Scanner Beam antenna and an R7000 receiver, watching signal levels and listening for background hiss and intermod products at various frequencies.

Under about 500 MHz gain and noise figures were very close; there did seem to be somewhat more intermod interference from strong shortwave breakthrough on the PRE-3, however. This was substantially reduced by soldering the shunt coil in place as shown in the instruction sheet.

At 1100 MHz there was significant difference favoring the 1000P; signals from aircraft transponders were clearly stronger in the GTI than on the Grove unit which utilizes one stage of bipolar amplification and no positive feedback to emphasize the upper reaches of spectrum. The manufacturers' specifications corroborate the difference in gain.

The Bottom Line

The GTI 1000P receiver preamplifier is better than the Grove PRE-3, but it costs over $100 more. Its choice would be preferred with an outdoor antenna installation in a large city (dense RF) environment, and when reception of signals above 500 MHz is an important consideration.

(1000P wideband preamplifier, $149.95 from GTI Electronics, RD 1 Box 272 Dept MT, Lehighton, PA 18235; ph. 1-717-386-4032)

TEXPRO Snap-on Choke

With incidental electrical noise saturating the airwaves, listeners are always looking for relief from the assault by interference. Although shielded cables and adequate grounding can do wonders, there is always room for more assistance.

While internal modifications can be made to noise-generating equipment (motors, computers, transmitters, fluorescent lights, microwave ovens, TV sets, etc.), wouldn't it be nice if a simple external fix could do the job? In some cases it can.

Many sources of interference radiate or conduct their electrical noise via interconnecting cables and power cords; if a barrier can be added which prevents the signal from coming out of the box, it won't continue down the cable.

The miracle of ferrite and powdered iron cores has been known for years; often a rod of this material can serve as a core, around which the cable is wrapped to prevent undesirable interference currents from travelling any further.

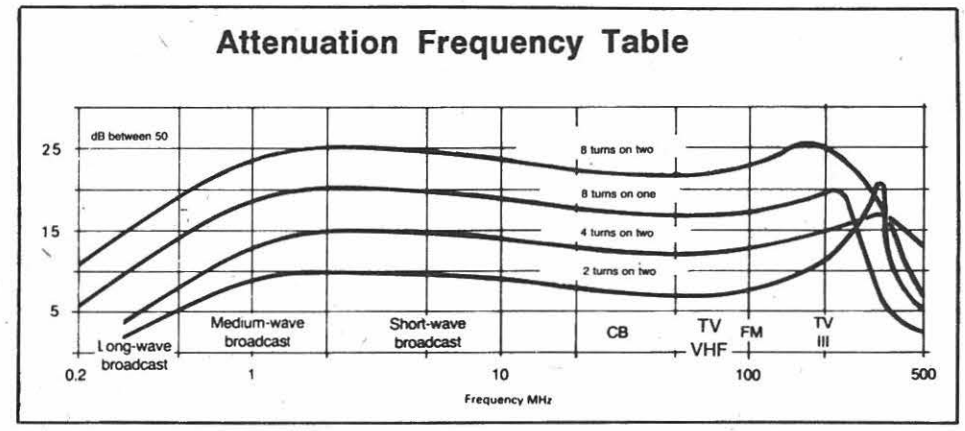
Even better, toroid (donut-shaped) cores are even more efficient, confining the unwanted signal within its RF-conductive ring. But toroids are closed; what do you do about a cable which already has a connector on the end and won't fit through the opening?

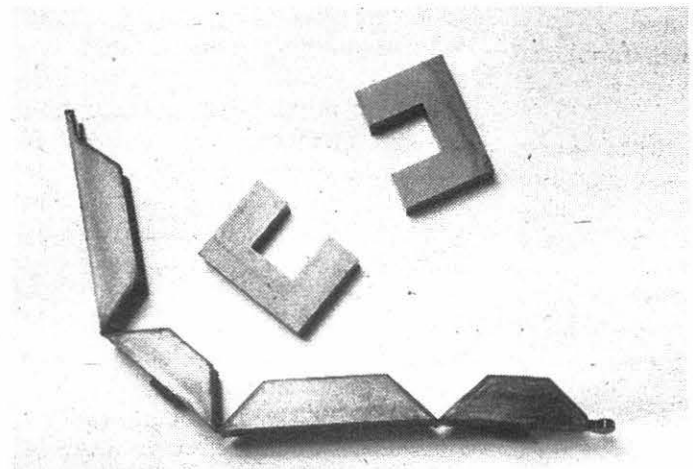
TEXPRO Manufacturing has introduced a split toroid which can be assembled over the cable, or permit the cable to be wound around it, then reassembled for use (see accompanying photos). The manufacturer recommends it for applications from medium wave broadcast right through VHF. But will it work?

Our Test

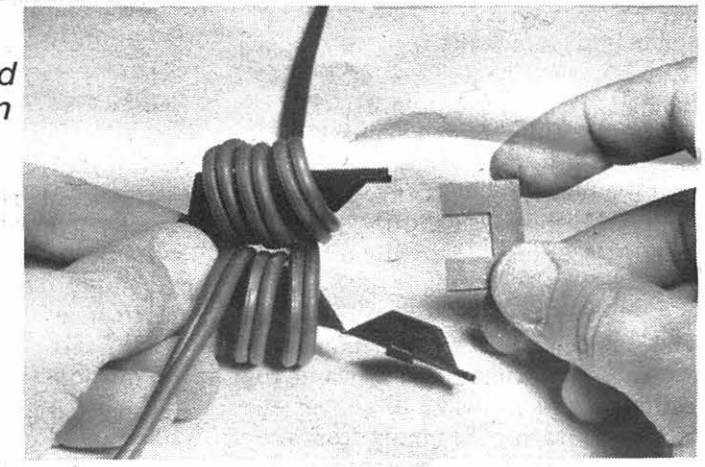
The *Monitoring Times*/Grove Enterprises office building is located within fifty feet of our monitoring post and when the four business computers are going, there is considerable temptation to consider another hobby. Could the TEXPRO Snap-On Chokes help?

One at a time, the computers were turned on and their interference frequencies tuned in on the shortwave and VHF/UHF receivers. With one person watching the S meters, the other would install the TEXPRO filters on various cables. Intercommunication was coordinated via hand-held transceivers.

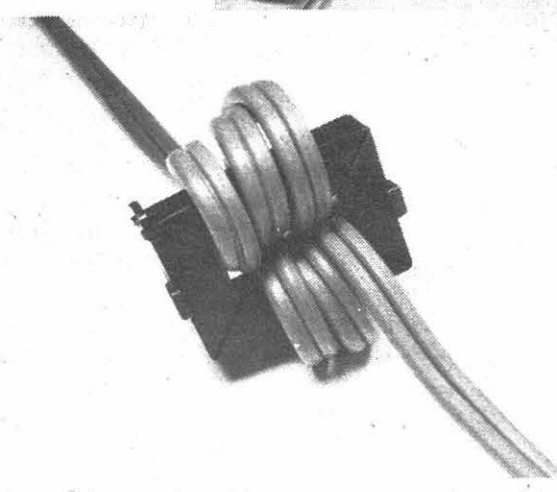




The TEXPRO Snap-On Choke disassembled



Winding an AC line cord around the core section



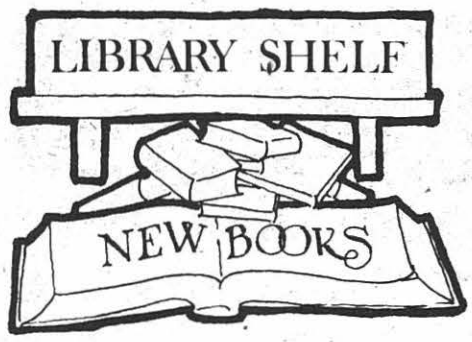
The line filter completed and ready for use.

As the cable to the video monitor was wound around the choke, the interference was substantially reduced--anywhere from 10 to 20 dB, depending upon frequency. Combinations of chokes and windings of the cable could be optimized by experimentation.

Complete instructions come with the little devices which sell typically for about $3-$4 apiece, depending upon quantity. They are also available under private label from some *MT* advertisers.

(TEXPRO Manufacturing, 533 Galway Drive, Dept MT, Burlington, Ontario, Canada L7L 2S6; ph. 416-333-1344)

■



NOVICE VOICE CLASS STUDY PACKAGE from W5YI-VEC

(Vinyl binder, book, cassettes, $19.95 plus $1.50 shipping from W5YI-VEC, PO Box 10101, Dept MT, Dallas, TX 75207 and from Radio Shack stores)

About 37 years ago the FCC created a new license class to encourage newcomers into the ranks of ham radio--the Novice class. Although it limited operation to low power, narrow frequencies and crystal control, it did permit voice operation on the growing 2-meter band.

Than came the debacle called "incentive licensing" which removed voice privileges from the Novice class and discouraged new blood from being infused into ham radio. Now, decades later, with the average age of amateurs at about 50 years, a renewed attempt is being mounted to once again encourage young entrants into a fascinating and largely overlooked hobby.

Fred Maia and Gordon West collaborate on what may be the most widely distributed license preparation program in amateur history.

Recently, the FCC reinstated voice operating privileges for the Novice, and this time on the amateur 10-meter band which is wide open to global communications. With a basic test and only 5 words per minute of code speed required, anyone interested in getting into ham radio should jump at the chance.

Few names in amateur license test instruction are as widely known and respected as Fred Maia (Publisher of the *W5YI Report*) and Gordon West (Gordon West Radio School). Now the two have combined their individual successes to produce what may be the most widely distributed license preparation package in amateur history.

Consisting of two Morse code cassettes (complete with musical fanfare, no less!), a superbly prepared and printed study manual, a license application form, and a sample test, the package makes entering into ham radio easier than ever before.

THE "TOP SECRET" REGISTRY OF U.S. GOVERNMENT RADIO FREQUENCIES

New 6th edition by Tom Kneitel (192 pages, 8-1/2" x 11", paperbound; $17.95 plus $1.50 shipping from Grove Enterprises and other MT advertisers)

It has been more than a year now since a major organized crime bust in Florida turned up an elaborate listening post for intercepting drug interdiction communications, and a copy of Tom Kneitel's *"Top Secret" Registry*. While there is really nothing "top secret" about its contents, it is the largest massing of sensitive government radio frequencies in commercial publication.

Now, Kneitel has printed his sixth edition of the work, updating many earlier listings and adding some as well. While utilizing private rather than official sources, the new volume boasts improved accuracy, a common criticism of earlier editions.

Kneitel displays no pangs of guilty conscience in the contents of the Registry; in its pages are largely-confirmed listings of Secret Service, Customs, DEA, CIA, NSA, White House, Border Patrol, ATF, and dozens of other governmental departments and bureaus, many of whom would really rather not have their communications frequencies widely propagated.

An introductory chapter lends excellent perspective to the world of monitoring. His various suggestions for equipment and accessories are good with one exception: Kneitel continues in each edition of his *Registry* to implore readers not to use RG-6/U or RG-59/U coax cable "since they are intended for TV sets and not for communications equipment." There is no justification for that caveat.

The book is divided into two basic schemes for looking up listings: by location and by agency. Many tactical identifications and official call signs are included.

Honed with each successive edition, the 6th edition of Tom Kneitel's *"Top Secret" Registry* is the leading source of VHF/UHF frequency information for monitoring federal government and military communications.

RADIOTELETYPE MONITORING

by Dallas W. Williams (54 pages, 8-1/2" x 11", paperbound; $9.95 plus $1 shipping from Tiare Publications, PO Box 493, Dept MT, Lake Geneva, WI 53147)

Inexpensive and informative are th first words that come to mind upo examining the contents of this ne publication from Gerry Dexter organization. While there are oth more massive frequency listings ar more sophisticated discussions RTTY, Williams has managed explain the art and the scien concisely.

The introductory chapters abour with useful orientation for th newcomer to RTTY as well as th seasoned listener who could benef from an easy-to-read refreshe course. Williams describes receiver demodulators, modes of transmi sion including crypto, machine press agencies, interpreting th messages, and tuning techniques.

Over 300 discrete frequency listing mostly for meteorological and diplo matic channels, include informatio on speed, shift, call sign, locatio and schedule. A separate glossary provided for circuit identifiers an agency abbreviations.

Scanner Sneak Preview

by Bob Grove

A spate of new scanners being released from several major manufacturers includes some real surprises! Although full details have not yet been revealed on all of them, here's what *MT* was able to learn at press time.

Radio Shack

A major new product introduction in the fall catalog is the PRO-38, a miniature pocket programmable scanner with full features at a stunning low price. With frequency coverage of 29-54, 136-178 and 406-512 MHz, the mighty midget measures a scant 2" x 1" x 6" and retails for only $139.95.

Volunteer firefighters will love the new, low-cost PRO-27 crystal scanner. Two channels may be selected in high band and/or UHF in a 4-5/8" x 2-3/4" x 1" package. Only $50!

A number of new products from other manufacturers will be nipping at the heels of Radio Shack's popular PRO-2004 desktop scanner, presently conceded to be the best scanner on the market although the price has edged upward to $419.95 (still discounted at $379 from Grove Enterprises).

Fox Technology

Following a volley of on-again, off-again acquisition attempts, the present Fox organization is taking a wait-and-see attitude toward their proposed Micro 100 pocket programmable scanner, on hold until technical problems are ironed out. No further development has taken place on their Tracer series scanners, in the planning stage now for several years.

Regency Electronics

Introduction of the only two new models from Regency, the Turboscan models TS-1 and TS-2, have been delayed due to technical problems. Regency expects delivery on the TS-2 as early as late August and on the TS-1 in late September.

Uniden

The biggest surprises are coming from Uniden. Will Bearcat regain its position of eminence in the scanner market? Let's take a look at some of their imminent offerings and see.

Clockwise from above: Bearcat BC-210XLT, BC-600XLT, BC-580XLT, and BC-70XLT

The immensely popular BC-100XL hand-held will become a BC-100XLT and sport 100 memory channels; introduction is expected in October with a slight increase in cost.

A new hand-held programmable, the BC-200XLT, will include the 800 MHz band in addition to the customary land mobile and VHF aeronautical bands. 200 memory channels may be scanned in 10 banks of 20 channels each; features include priority, search, lockout, and delay.

The 200 comes with a detachable NICAD battery pack and AC charger, leather holster and BNC equipped flex whip. Look for it in October with a suggested retail of $499.95.

Improvements in the recently-introduced BC70XLT have addressed the poor squelch sensitivity problem. And an upgraded model, the BC75XLT, will add aircraft reception and 100 channels of memory--at a slight increase in cost.

Watch for the new BC580XLT, a compact version of the popular--but discontinued--BC300. This base/mobile scanner measures less than 2" high by 7" wide and deep, flaunts 100 memory channels (5 banks of 20 channels each), and has pre-programmed automatic search capability for police, fire, emergency, aircraft, weather, and marine frequencies.

Additional features include programmable search, priority, lockout, direct channel access, and delay. Illuminated controls support nighttime use. The 580 should be substantially discounted from the suggested retail of $399.95.

A special upgraded version of the BC580XLT, the BC600XLT, offers two remarkably innovative options: a preamplifier for weak signal improvement ($25) and a CTCSS tone-squelch decoder ($60), both of which plug into the underside of the BC600XLT. Accessories which are included are a tilt-down bracket for desktop use, plug-in telescopic antenna, AC and DC cords for base and mobile operation, and mobile mounting bracket.

Rear panel jacks allow the use of an external antenna, tape recorder and external speaker or headphones. The BC600XLT is available for $224.95 plus $5 shipping from Grove Enterprises.

Slightly upgraded from the BC580XLT will be the BC960XLT, possibly available by Christmas, sporting 200 memory channels and 800 MHz coverage as well.

The frosting on the new product cake, however, will be the exciting BC1000XLT, boasting continuous, no-gap coverage from 25 through 1300 MHz, an S meter, tuning dial as well as direct frequency entry, 200 memory channels (sequential or banked), and automatic tracking of 800 megahertz trunked signals! But don't look for this one until next year.

After a painful period of reorganization under Japanese acquisition management, Bearcat could once again ascend the throne of scanner leadership. ■

Ike Kerschne
RD 1, Box 181-
Kunkletown, PA 1805

ACCESSORIES: Part 2

Radio, by its very nature, appeals to folks who are curious and interested in the world around them. Without such interest, radio would not exist. It follows, then, that as our knowledge about radio increases, we become more interested in other areas of the hobby.

Consider the anguish of the radio hobbyist who, after taking out a mortgage on the farm to purchase a super deluxe general coverage receiver, finds his new interests exceed the limits of "general coverage."

The purchase of an additional receiver that will satisfy the new interest more often than not is out of the question. The bank won't take a third mortgage, and our spouse has mentioned divorce or homicide --- or even both -- if we bring another radio into the house. Now, what?

The best course of action is to purchase a frequency converter that will extend the range of our regular general coverage receiver to cover higher or lower ranges that it presently does.

Using Converters

In general terms, there are two types of converters. The down converter produces signals on a band that is lower in frequency than the normal range of general coverage receivers. The other converter is, of course, the up converter and it allows us to tune frequencies higher than our general coverage receiver can handle.

First, connect an antenna for the frequency range the converter is designed for to the antenna terminal on the converter (see figure 1). Now run a short coax cable from the output of the converter to the antenna terminal of the receiver. Most converters do not have a built in power supply and the user must provide power either from batteries or an external power supply (some receivers provide low voltage output to power a converter).

Now our station receiver is tuned across the IF (intermediate frequency), this will usually be the 28 to 30 MHz band for up converters and 3.5 to 4 MHz for down converters. Often the user can specify the frequency range he wishes to use as an IF. It depends on the manufacturer of the converter.

Now, by tuning the general coverage receiver through the IF range, you will hear signals on the band the converter is designed for. To determine the frequency of the incoming signal, the operator simply uses the converter's frequency coverage range in place of the IF. For example, if we have an up converter designed for 220 to 222 MHz and an IF frequency of 28 to 30 MHz, then 28 MHz becomes 220 MHz and 30 is now 222 MHZ. So if the receiver is tuned to 28.100, the received frequency will be 220.100 MHz.

Some modern receivers are designed to be used with converters made specifically for that receiver. The receiver, then, will display the exact received frequency. If you use a converter other than the one specifically designed for that receiver, it will operate in similar manner to that illustrated in the preceding paragraph.

Limitations

Modern converters cover only a frequency range of 2 MHz with any degree of sensitivity. It is possible to purchase units that cover much wider ranges although this type of converter is not widely available.

Tunable Converters

Some wide band converters are constructed so that the general coverage receiver is set to one frequency and left there and the converter itself is tuned across the frequency range. This type of unit was popular from after World War II until the mid fifties. Diligent searching at a hamfest will often turn up such a converter. Tunable converters will always, however, suffer instability problems and are really not satisfactory for serious use.

If the listener is interested in several frequency bands not covered by his receiver, general practice is to purchase several converters for the ranges desired and switch them into the receiver as shown in figure 2.

Down converters are available from the Heath Company, Palomar Engineers. This is far from a complete listing of converter manufacturers, however, perusal of any radio magazine or catalogue will often turn up many more, some offering rather unique features. Prices vary from about thirty to eighty-five dollars.

Antenna Switches

In a busy radio shack, one of the handiest add ons is the antenna or coax switch. Take a look at figure 2. In this diagram, we have a three position switch which will switch from either one of the two converters or the station antenna to the receiver. It is just as easy to switch one converter and two antennas or whatever. Coax switches are available with two to twelve positions, most common are five and six position units (See figure 3.)

The normal coax or antenna switch will automatically ground all unused positions. Generally, the coax switch will have one position that causes all inputs to be grounded for added lightning protection.

There are many manufacturers of coax switches, among them Heath, B&W, Daiwa, MFJ and others. All are fine for the SWL although the amateur who wants to transmit should be sure the switch is able to handle the amount of power his transmitter is capable of. All radio stores carry coax switches.

Improving Selectivity

Frequently, while listening to amateurs and utilities, interference is severe and many less expensive receivers simply are not selective enough to enable the listener to copy stations easily in a crowded band.

A neat device that has been kicking around for many years but which receives little attention from the SWL gang is the audio filter. Audio filters cause the received audio to b restricted to a very narrow bar width and limits noise and interfe ence nicely. Ranges from a fe hundred Hertz for Morse receptic to about 3.5 kHz for SSB receptic are common in these audio filter making them well worthwhile for us in crowded conditions.

The audio filter connects betwee the receiver and headphones, c speaker. Normally, the audio filter self-powered by a battery or built-i power supply. Consequently, it only necessary to plug your hea phones or speaker into the unit an turn it on.

Using an audio filter often make th difference between perfect copy an no copy. I use one at my shack t help dig out the weak signals on 16 and 80 meter CW. Many contac would not have been possibl without this little gem.

The most popular audio filter made by MFJ and prices range fro $49.95 to $99.95.

That's all for this month. Pleas remember the SASE if you require personal response to a query.

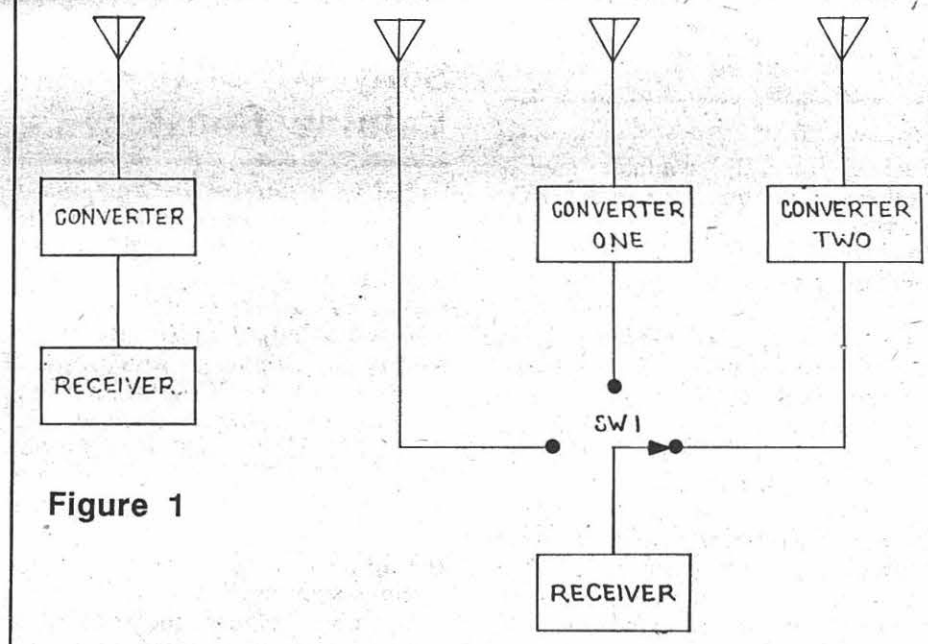


Figure 1

Figure 2

Coax switches are available with two to twelve positions - five and six positions being the most common.

Figure 3

Foreign Pro-2004 Freq Restoration

As shipped to the United States, only the cellular portion of the 806-960 MHz band has been disabled on the popular Radio Shack PRO-2004 by the installation of a diode, D513. Its removal and subsequent restoration of that coverage has been the topic of previous issues of *MT*.

We have learned that for European distribution, another diode (deleted for U.S. sales), D512, is added to disable 66-88 MHz coverage. European owners of this scanner may wish to follow the same directions as provided in the April 1987 issue of *MT*, substituting "D512" for "D513".

A complete set of instructions is provided by Grove Enterprises with each PRO-2004 sold through their catalog. Copies are available for $2 from *MT*.

We would like to thank Tom McElvy of the Old Dominion DX Association for sharing his interesting findings with fellow *MT* readers.

A Mobile Bracket for the PRO-2004

Although there is no commercial bracket presently available specifically for the popular Realistic PRO-2004 scanner, *MT* reader David Branscome of Newark, Ohio, has come up with an excellent substitute.

Dave has discovered that the strain relief bracket which is made for the Uniden Bearcat BC210XW (and similar sized scanners) fits the PRO-2004 after pulling out slightly on the ends of the bracket.

In the past, other readers have pointed out that some of the universal auto stereo mounting brackets can be adjusted to hold scanners as well.

We appreciate these hints sent in by our readers to be shared with fellow listening hobbyists.

CAVEAT

A slight correction is in order for the diagram in our April issue (page 28). While author Fissell's approach to bypass the preselector and preamp is excellent, the labels are switched on the two boxes.

A preselector should always be placed before the preamplifier (between the antenna and the preamp) in order to restrict the frequency range, thus eliminating broadband overload problems that would occur if a large antenna is connected directly to the preamp.

Scratch-Proof Mag Mount

While magnetic-mount mobile antennas like the popular Grove ANT-10 scanner antenna have good holding power, they can mar paint if they are dragged across the car's surface when dust or grit are trapped on the attachment surface. H. M. Beck of Tustin, California, has a solution.

He cut a circle of thin rubber gasket material used on outdoor electrical boxes, about two inches in diameter and 1/16 inch thick, and cemented it to the bottom surface of the antenna mount. Not only does the pad prevent scratching but, according to Beck, even adds better gripping of the surface--all with no loss of magnetic hold.

Sony ICF2010 Volume Boosters

I read with interest the remarks of low volume on the Sony 2010 in the March issue of *MT*, p.60 ("Sony ICF2010 Going Soft"). It is not a matter of quality control by Sony; low audio output allows for better battery consumption which was a problem with the ICF2001. ICF2010 has only 380 MW power output. The SonyICF2002 has 400 MW output. Both units allow for 30-40 hours of battery life with this type of power.

If I do have a problem on low signal stations such as Tarawa (Kiribati), I use my tape recorder for amplification. Also Heath Co. has a 1 watt kit amplifier that helps boost audio--the SK104 for boosting audio and the SK107 for synthesized stereo (two speakers), each priced at $14.95.

Radio Shack also lists a 9" speaker with volume control with 1 W output, $19.00, and a 5 W+ unit that is AC unit with speaker and amplified for public service use. It lists for $99 and is on sale at times for $80. *(Paul Donegan)*

Instant Weather Button on Your Scanner

From Philip Smith: The "Priority Scan" feature on many scanners is handy for someone who wishes to keep a close eye on a certain frequency while scanning or searching others. However, I tend to find the frequent audio interruptions annoying for everyday listening.

Until recently, I rarely made use of the priority feature...that is, until I made a simple discovery. By moving the local weather station to channel #1 and locking out that channel, I had converted the priority button to a "weather button." Within two seconds after pressing the button, I have the weather. Another push sends the radio back to normal scanning or searching.

Planning Your Listening Post

by Larry Wiland

If you're like most radio enthusiasts I know, you own more than one scanner or receiver and may have dozens of accessories for monitoring those elusive stations. You will also find it necessary to stack it to the ceiling if you accumulate "piece-by-piece" and do not plan in advance for a place for each item as your acquire it. I have compiled some possible solutions to teetering piles of unstable equipment and fire hazards as well from unsafe practices.

Electrical Power: You will first be faced with the dilemma of having ten pieces of equipment and two outlets. You will either have to install larger, multi-plug outlet boxes or purchase a "temporary" multiple-plug power strip.

These strips are fused, switch-operated boxes which contain four to six plug-in outlets in a single unit and may be mounted along the baseboard on on your radio table. Some power strips such as the Grove ACC23 include built-in surge spike protection. Simple power strips usually cost $7-$15 while surge-protected units bring $20-$30 or more.

Tables & Chairs: The ultimate table for a listening post is a computer table with the accessory monitor stand; this double-decked console provides storage for books and frequency guides as well as space for a video terminal, shortwave receiver(s), clock, and scanners. There may also be room for lamps, under-counter lighting, and just about anything else you might need. The adjustable shelves allow great flexibility.

Remember to provide adequate lighting for nighttime operations and "dark days." Make sure the chair you select for your monitoring post is comfortable and consider one with casters for mobility. Nothing is worse than spending several hours in an uncomfortable chair and having aches and pains hours later as a reminder! Buy carefully.

Antennas: Be sure to locate your operating position near a window or someplace in the house where cables for outdoor antennas can be run inside with a minimum of hassle or without need of excessive cable length.

Some type of antenna selecting switch or connector panel is also something to consider when dealing with multi-antenna setups. Plan the route of your wiring in advance to avoid a great deal of time and frustration later.

Other Considerations: All equipment should be grounded. Not only does this decrease the electrical line noise in your receivers, it also decreases the possibility of electrocution. Provide a means of disconnecting antennas during a storm to protect you, your equipment and your home.

Equipment should be arranged so as to be readily accessible with the most-used items the easiest to reach. Clocks and other readouts should be clear of obstructions and easy to see. Equipment ventilation slats in equipment cabinets should not be obstructed or covered, and radios should be dusted or cleaned periodically.

With a bit of advance planning, coupled with common sense, a listening post can not only be safe, but a thing of beauty, too.

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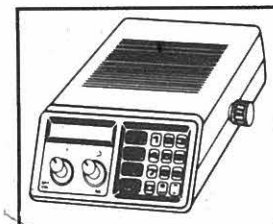

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MX-3000

Special $169.99

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30 CHANNELS—MOBILE/BASE

—SCANNER WORLD EXCLUSIVE—

Features include simple programming of the following frequency ranges: 30-50 MHz, 144-174 MHz, 440-512 MHz. Digital display, priority, search, lockout, delay, dim control, top mounted speaker, one year factory warranty. Includes AC & DC cords, mobile mounting bracket, telescopic antenna. All for only **$169.99** plus $7.00 shipping (optional extended warranty: 3 years $39.99; 2 years $29.99.) MX3000 Service Manual $5.00.

Cobra SR-15

$219.99 *($7.00 shipping)*

100 channel pocket sized hand-held scanner (6"Hx2 3/4"W), no crystal, portable scanner, 29-54 MHz, 118-174MHz, 406-512 MHz, bank scanning, backlit LCD display, automatic search, lockout, scan *delay, priority, key lock, plus much more.* Includes rubber antenna, rechargeable Ni-Cad battery pack, AC adapter charger, earphone, and carry case. optional cigarette lighter adapter #15MPC $12.99.

BEARCAT 100XL Hand-Held Programmable	194.99	(7.00)
REGENCY INF-1 Informant Scanner	$249.99	(7.00)
BEARCAT 70XLT Programmable Hand-Held	169.99	(6.00)
BEARCAT 50XL Programmable Hand-Held	119.99	(5.00)
AD100U AC Adapter/Charger for 50 XL	12.95	(*)
BP55 Ni-Cad Battery Pack for 50XL	13.99	(*)
CA5O Carry Case for 50XL	11.99	(*)
PS001 Cigarette Lighter Adapter for 50XL/100XL	12.95	(*)
BEARCAT 140 AC Programmable Scanner	94.99	(5.00)
BEARCAT 145XL AC Programmable Scanner	99.99	(5.00)
BEARCAT 175XL AC Digital Scanner	159.99	(5.00)
BEARCAT 100XL Digital Hand-held	194.99	(7.00)
BEARCAT Weather Alert	39.99	(4.00)
BEARCAT 210XLT AC/DC Digital Scanner	199.99	(7.00)
BEARCAT 800 XLT AC/DC Digital Scanner	299.99	(7.00)
REGENCY R1075 AC Digital Scanner	94.99	(6.00)
REGENCY MA-257 Cigarette cord for HX1000/1200	16.99	(*)
REGENCY MA-917 Ni-cad Battery for HX1000/1200	24.99	(*)
REGENCY HX-CASE Hvy Leath. case for HX1000/1200	19.99	(*)
REGENCY MA-549 Drop in charger for HX1000/1200	89.99	(5.00)
REGENCY MX-3000 AC/DC Digital Scanner	169.99	(7.00)
REGENCY HX-2200 Digital Hand-Held Scanner	172.99	(7.00)
REGENCY Z-30 AC/DC Digital Scanner	129.99	(5.50)
REGENCY Z-60 AC/DC Digital Scanner	149.99	(7.00)
Mobile Mounting Bracket for Z Scanners	5.99	(*)
REGENCY ACT-R-1 AC/DC Crys. Single Channel	75.99	(4.00)
REGENCY RH-256B High Band Transceiver	359.99	(7.75)
REGENCY UC 102 Hi-VHF Hand Transceiver	119.99	(5.50)
REGENCY RH-600B High Band Transceiver	429.99	(7.75)
REGENCY R806 AC/DC Crystal Scanner	79.99	(5.00)
COBRA SR12 Digital Hand-Held Scanner	199.99	(6.50)
COBRA SR10 Digital Hand-Held Scanner	129.99	(6.00)
COBRA SR900 AC/DC Digital Scanner	109.99	(5.00)
COBRA SR925 AC/DC Digital Scanner	164.99	(6.00)
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Book "Covert Intelligence, Electronic Eavesdropping"	8.95	(*)
Book "Betty Bearcat Frequency Directory"	14.95	(*)
Book "Rail Scan Directory"	7.95	(*)
Book "Air Scan Directory"	12.95	(*)
RCD MRP-1 Single Channel Hand-Held	38.99	(3.00)
FANON M8HLU DC Crystal Scanner	89.99	(5.00)
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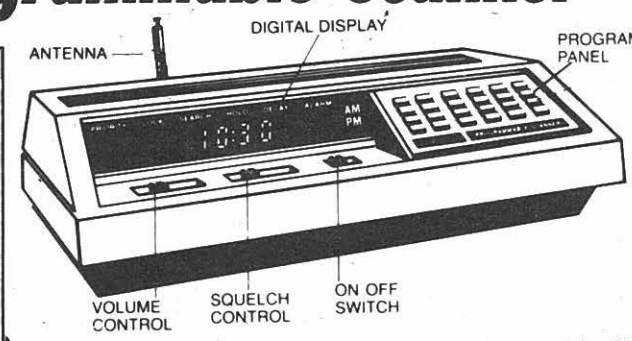
30 Channel Automatic Programmable Scanner

Scanner World Special

$129.99

(plus $5.50 shipping each)

Optional Accessories:
Cigarette Lighter Plug RGMPC . $4.95
Z Mobile Bracket — ***Special*** . . . $5.99



The Regency Z30 is a compact, programmable 30 channel, multi band, FM monitor receiver for use at home or on the road. It is double conversion, super heterodyne used to receive the narrow band FM communications in the amateur, public safety and business bands: 30-50, 144-174, and 440-512 MHz. Size 10 3/4"Wx2-7/8"Hx8-3/8"D.

Sophisticated microprocess-controlled circuitry eliminates the need for crystals, instead, the frequency for each channel is programmed through the numbered keyboard similar to the one used on a telephone. A "beep" acknowledges contact each time a key is touched. The Z30 scans approximately 15 channels per second.

Any combination of two to thirty channels can be scanned automatically, or the unit can be set on manual for continuous monitoring of any one channel. In addition, the search function locates unknown frequencies within a band.

Other features include scan delay, priority and a bright/dim switch to control the brightness of the 9-digit Vacuum-Fluorescent display. The Z30 can be operated on either 120 VAC or 12 VDC. Includes one year warranty from Regency Electronics (optional 3 yr extended warranty only $39.99, gives you a total of 4 yrs complete warranty or 2 yr extended warranty only $29.99, gives you a total of 3 yrs complete warranty.) Z-30 Service Manual $5.00.

Regency® **HX2200**

$172.99

(Plus $7.00 shipping each)

Digital Programmable 20 Channel Hand-Held Scanner with raised button keyboard for easy programming of the following frequency ranges: 118-136 MHz, 138-174 MHz, 406-512 MHz, 800-950 MHz (NOTE: This is the only hand-held portable scanner which will receive the 800-950 MHz range plus high band, air, and UHF). Features include priority, scan delay, memory backup, dual scan speed, channel lockout, jacks for external antenna and earphone, 90 day factory warranty, keyboard lockswitch, sidelit liquid crystal display for night use, program AM or FM mode, search or scan, size is 3" x 7" x 1½". Complete HX2200 package includes Ni-Cad rechargeable batteries, wall charger adapter, protective carry case, and rubber antenna. All for the low price of only **$172.99** plus $7.00 shipping each. (Optional extended warranty: 3 years $39.99, or 2 years $29.99)

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Bearcat

BC-600 XLT

$224.99 *($7.00 shipping)*

Digital Programmable 100 Channel Scanner

BC-600 XLT covers the following frequencies: 29-54 MHz, 118-174 MHz, 406-512 MHz. Features compact size of 6-5/16"Wx1-5/8"Hx7-3/8"D, scan delay, priority, memory backup, channel lockout, bank scanning, key lock, AC/DC power cords, telescopic antenna, mounting bracket supplied, one year factory warranty, search, direct channel access, track tuning, service search including pre-programmed frequencies by pushing a single button for police fire/emergency, aircraft, weather, and marine services. Plus exclusive optional features never available on any scanner before. First is an RF receive amplifier for boosting weak signals for only $24.99 plus a CTCSS tone board is available for only $59.99 to make this the number one scanner available in the USA. Optional cigarette lighter plug #600MPC $4.99

REGENCY HX1500

Digital programmable 55 channel hand-held scanner. Frequency coverage 29-54 MHz, 118-174 MHz, 406-420 MHz, 440-512 MHz. Covers Public Service bands plus aircraft, trains, marine, plus many others. Has priority, search, lockout, scan, banks, sealed rubber keyboard. 90 day factory warranty. Includes flexible rubber antenna, belt clip and earphone.

$224.99 *(Plus $7.00 Shipping each)*

Optional Accessories Available for HX-1500: Call For Price:

REGENCY RH-256 B
PROGRAMMABLE TRANSCEIVER

RH-256B Transceiver, 16 channel 12 VDC 2-way Radio fully programmable in transmit and receive mode. Includes built-in CTCSS tones for encode/decode, time-out timer, scan delay, 25 watts transmit power, priority, plus more. Frequency spread as shipped 152-158 MHz. Package includes mobile mike, bracket, mobile antenna, and all cables and instructions for installation. ***Special package deal only:*** **$359.99** *(7.75 shipping)*

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(*) Add ($) per scanner, and $3.00* for all accessories ordered at same time. C.O.D. shipments will be charged an additional $3.00 per package. Full insurance is included in shipping charges. All orders are shipped by United Parcel Service. Shipping charges are for continental USA only. Outside of continental USA, ask for shipping charge per scanner.

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Making a Good Antenna Better

(Due to the vagaries of the U.S. Mail, this month's antenna column is a rerun of a never-ending subject of interest--how can we improve the antenna we've already got?!)

When we ponder the function of the antenna in our communication system, we realize that it is, quite literally, our interface with the rest of the communications world. The importance of an adequate antenna for your communications system cannot be overemphasized.

Our requirements may be well satisfied by a mediocre antenna system if our interests are limited to such non-demanding activities as monitoring local (and therefore strong) utility signals, or casually tuning the short-wave bands. But when we want to pick up distant weak signals or transmit to far-away QTHs, then antenna performance becomes an important factor in the overall performance of our system.

Antennas Can be Tuned!

Most of the antennas in use today are of the type that are designed to be resonant at the frequency or band of operation. For example, antennas such as the half-wave dipole, groundplane, Yagi-Uda, colinear, inverted-vee, and most other antennas you can think of are of the resonant type.

Non-resonant antenna types are much fewer in number and include the Beverage, rhombic and non-resonant vee (don't confuse this with the inverted vee). Since the non-resonant antennas tend to be very large, expensive and difficult to erect, most people reading this column are probably using some type of resonant antenna system.

If the antenna is resonant, it essentially functions like a tuned circuit at the frequency or band for which it is designed. When your rig, line and antenna are matched, this resonance tends to produce the maximum signal output to your receiver and also provides the antenna's "textbook" radiation pattern when transmitting.

Most of us use commercially manufactured antennas or antennas which we have constructed at home from instructions in a "how-to-do-it" publication. These antennas were designed for some theoretically "average" site, or perhaps for theoretically ideal conditions.

Since our station site will depart to some degree from either average or ideal conditions, the antenna will not be optimally matched to our specific site in the vast majority of cases. Not only will it probably not have quite the resonant frequency for which it was designed, its radiation pattern will likely not be as anticipated, it will likely not have the impedance its design specifies and will not, therefore, match the impedance of the coaxial cable which we use.

J.D. Wells has stated this problem as follows: "Most of the ... patterns you see in the handbooks are for an antenna remote from earth. And when they say remote, they mean RE-mote! The ground has considerable effect on ham antennas below 30 megacycles because we don't get five or six wavelengths from ground.

What this means is that the directivity pattern is not ideal, the impedance at the center is probably not 72 ohms, and the angle of radiation is most likely not what we would like it to be. Also you don't have a perfectly conducting ground under it and you may get combinations of effects that would defy description."(1) Well said, Mr. Wells.

So What?...

...you may ask at this point. Am I trying to prove that most of us have less than optimal antenna systems? Well, in a way, yes. Although the average antenna is probably functioning "adequately," most of us can improve the operation of our communication systems considerably if we take the trouble to tailor the antennas which we use to the site where they are erected.

If we decide that we want to do this, the question arises as to just how to accomplish the feat. Let's survey some of the approaches and equipment types that are used for this purpose.

Common Antenna Test Gear

The most common instruments used in adapting antennas to a specific site include: the noise bridge, the dip meter, the antenna impedance meter, the field strength meter (FSM), and the standing-wave ratio meter (SWR meter).

The first three of these instruments do not require a transmitter at the station under test; The last two instruments are generally used at sites which employ a transmitter because they are designed to assess a signal after it leaves the antenna (the FSM) or as it is fed to the antenna system (SWR METER).

Noise Bridge

The noise bridge is a means of generating noise across a wide band of radio frequencies, and then detecting the response of your antenna to these frequencies. With this instrument you can determine your antenna's resonant frequency and impedance; as well as make some useful transmission line measurements.

Dip Meter

The dip meter, the modern version of the tube-type grid-dip oscillator, is a resonance-indicating device. It consists of a small portable oscillator which is affected by nearby resonant circuits.

The effect is such that a change (dip) in current in the oscillator is caused when the oscillator is tuned to the resonant frequency of the nearby circuit. By coupling the oscillator to your antenna, you can determine the antenna's resonant frequency.

Antenna Impedance Meter

An antenna impedance meter, sometimes called an "antenna bridge," "antennascope" or "Z-scope," allows you to determine the feedpoint impedance of your antenna. By shortening or lengthening the antenna, you can bring the impedance to the proper value to match the feedline, allowing maximum power transfer.

Use of an antenna impedance meter requires a source of radio frequency signal; usually, this signal is furnished by a dip-oscillator, but other low-power oscillators may be employed.

Field Strength Meter

The field strength meter is essentially a simple receiver which presents its output visually via a meter movement which increases as the antenna's output increases. Some models give an audible output as an added convenience and also for use by blind operators.

During antenna adjustments, field strength meters can be used to indicate relative signal output strength. Some models are tunable and may be used to check for the presence of specific harmonic frequencies with the antenna may be radiating.

Standing-Wave-Ratio Meter

The SWR meter is probably the best known, and perhaps most misused, of the popular antenna test instruments. An SWR higher than one indicates that some power is being reflected from the load on the transmission line (the antenna in this case) back to the source (the transmitter). This sounds bad to us and we generally get the idea that the SWR should be as close to 1/1 as possible.

Theoretically, that's true, but we have it on good authority that ratios as high as 10/1 are not unacceptable on HF when we have low feedline losses. Values of 2/1 or even 4/1 are generally not cause for much concern as far as antenna system efficiency goes, but some solid-state rigs can't tolerate such SWR levels. Everyone should read discussions such as those by Bill Orr (2) or John Haerle (3) on the relative contribution of SWR level to signal output.

In an SWR meter is inserted in the transmission line between the transmitter and the antenna tuner, the tuner can then be used to adjust the SWR of the antenna system for more efficient operation. This won't correct for mismatches at the antenna and of the transmission line, but if your transmission line is relatively low-loss, your system is likely to perform well anyhow.

Summary:

It is not the intention of this column to make you suspicious of, or unhappy with, your present antenna system; it's probably doing a fine job. Just as we don't need finely-tuned race cars to get us around town, we don't all need to fine-tune our antennas.

But some of us are concerned at times with getting the best performance possible from our antenna systems. When the going is tough and we want to read those tantalizing weak signals, an optimized antenna system can make the difference.

Specifics on how to use the test instruments described above are included in their instruction manuals, and to one degree or another in references 2 through 7 below. If you have particular questions about antenna tests and measurement, drop me a line. If enough readers show an interest on a particular topic, I'll try and cover it in a future column.

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Communications Electronics,™ the world's largest distributor of radio scanners, introduces new models of CB & marine radios and scanners.

NEW! Regency® TS2-RA

Allow 30-90 days for delivery after receipt of order due to the high demand for this product.

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12-Band, 75 Channel • Crystalless • AC/DC

Frequency range: 29-54,118-175, 406-512, 806-950 MHz.

The *Regency* TS2 scanner lets you monitor Military, Space Satellites, Government, Railroad, Justice Department, State Department, Fish & Game, Immigration, Marine, Police and Fire Departments, Aeronautical AM band, Paramedics, Amateur Radio, plus thousands of other radio frequencies most scanners can't pick up. The *Regency* TS2 features new 40 channel per second *Turbo Scan*™ so you wont miss any of the action. Model **TS1-RA** is a 35 channel version of this radio without the 800 MHz. band and costs only $239.95.

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Bands: 30-50, 88-108, 118-136, 144-174, 440-512 MHz.

The *Regency* Z60 covers all the public service bands plus aircraft and FM music for a total of eight bands. The Z60 also features an alarm clock and priority control as well as AC/DC operation. Order today.

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7-Band, 45 Channel • No-crystal scanner

Bands: 30-50, 118-136, 144-174, 440-512 MHz.

The Regency Z45 is very similar to the Z60 model listed above however it does not have the commercial FM broadcast band. The Z45, now at a special price from Communications Electronics.

Regency® RH256B-RA

List price $799.95/**CE price $329.95/SPECIAL**

16 Channel • 25 Watt Transceiver • Priority

The *Regency* RH256B is a sixteen-channel VHF land mobile transceiver designed to cover any frequency between 150 to 162 MHz. Since this radio is synthesized, no expensive crystals are needed to store up to 16 frequencies without battery backup. All radios come with CTCSS tone and scanning capabilities. A monitor and night/day switch is also standard. This transceiver even has a priority function. The RH256 makes an ideal radio for any police or fire department volunteer because of its low cost and high performance. A *60 Watt* VHF 150-162 MHz. version called the **RH606B-RA** is available for $459.95. A UHF 15 watt, 10 channel version of this radio called the **RU150B-RA** is also available and covers 450-482 MHz. but the cost is $439.95.

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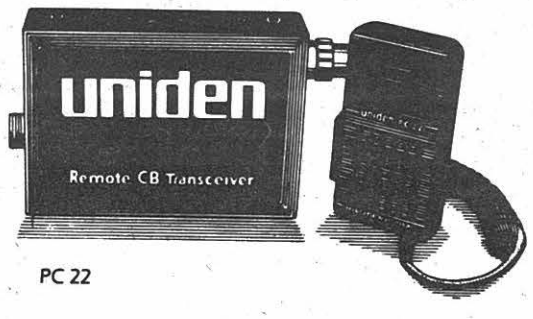
List price $199.95/**CE price $114.95/SPECIAL**

10-Band, 10 Channel • Handheld scanner

Bands: 29.7-54, 136-174, 406-512 MHz.

The *Uniden Bearcat* 50XL is an economical, handheld scanner with 10 channels covering ten frequency bands. It features a keyboard lock switch to prevent accidental entry and more. Also order the new double-long life rechargeable battery pack part # **BP55** for $29.95, a plug-in wall charger, part # **AD100** for $14.95, a carrying case part # **VC001** for $14.95 and also order optional cigarette lighter cable part # **PS001** for $14.95.



PC 22

NEW! Scanner Frequency Listings

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Frequency coverage: 35-54, 136-174 406-512 MHz.

The new *Regency* Informant scanners cover virtually all the standard police, fire, emergency and weather frequencies. These special scanners are preprogrammed by state in the units memory. Just pick a state and a category. The Informant does the rest. All Informant radios have a feature called *Turbo Scan*™ to scan up to 40 channels per second. The **INF1-RA** is ideal for truckers and is only $249.95. The new **INF2-RA** is a deluxe model and has ham radio, a weather alert and other exciting features built in for only $324.95. For base station use, the **INF5-RA** is only $199.95 and for those who can afford the best, the **INF3-RA** at $249.95, is a state-of-the-art, receiver that spells out what service you're listining to such as Military, Airphone, Paging, State Police, Coast Guard or Press.

Regency® HX1500-RA

List price $369.95/**CE price $218.95**

11-Band, 55 Channel • Handheld/Portable Search • Lockout • Priority • Bank Select Sidelit liquid crystal display • EAROM Memory Direct Channel Access Feature • Scan delay

Bands: 29-54, 118-136, 144-174, 406-420, 440-512 MHz.

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List price $349.95/**CE price $178.95/SPECIAL**

9-Band, 16 Channel • Priority • Scan Delay Search • Limit • Hold • Lockout • AC/DC

Frequency range: 30-50, 118-174, 406-512 MHz.

Included in our low CE price is a sturdy carrying case, earphone, battery charger/AC adapter, six AA ni-cad batteries and flexible antenna. Order your scanner now.

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PRO710E-RA *Uniden*40 channel CB Base $119.95
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List price $499.95/**CE price $289.95/SPECIAL**

12-Band, 40 Channel • No-crystal scanner Priority control • Search/Scan • AC/DC

Bands: 29-54, 118-174, 406-512, 806-912 MHz.

The Uniden 800XLT receives 40 channels in two banks. Scans 15 channels per second. Size 9¼" x 4½" x 12½."

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A Receiver Instruction Manual

I know many of you have a second-hand unit that didn't come with a manual. A lot of you did receive one, but found it boring or misleading. Those with earlier Japanese units, outside of getting a big laugh, didn't fare much better: "If, upon clockwise rotary of control, finding volume bigger gets..." or "Decreasing other in same proportion, effecting switch..." You get the point.

I've got nothing against the Japanese, having been with a lot of them; they're neat folk. Now, however, with their syntax in order, they seem to have gone overboard the other way. Way too technical and assuming too much. If you'll bear with me, I'm *not* going to talk down to you. What I plan to do is simply increase your enjoyment severalfold.

Ready?

RF Gain Control.. This little understood control, usually left fully clockwise for the life of the radio, can be the most useful of all! You want your initial "S" reading. Fine. After that, what do you have? I'll tell you. A signal that's, say, 5 dB over "S" 9 with a bunch of garbage running about "S" 5 - 7.

This control is directly analogous to the audio volume control, except it works at the front of the radio, not the rear. By just reducing (counter-clockwise) it, by the time your '5 over 9' signal hits around "S" 6, the crud is *gone*. Try this one and you're hooked.

When you wish to resume tuning, run it up again.

Another useful feature is "setting the noise level." Simply tune to an unoccupied area and drop your "S" 3 or 4 noise level to zero with it. You're not going to hear anything beneath that anyway and it fatigues the brain. If all of this has come as a big surprise, keep on reading.

ANL or Noise Blanker (NB)... On first observation, these controls seem to be self explanatory. Let's dig a little deeper.

An ANL (automatic noise limiter) does just that -- limit. An average value is quickly established by a capacitor and anything over that is "clipped." This can cause a slight amount of distortion that's more than offset by a small advantage in selectivity. You see, a little side "buckshot" is also perceived as noise and thus reduced. A good control to leave on all the time. Surprise!

A noise blanker, on the other hand, is an entirely different breed of cat. What it does is actually turn the receiver off during a noise pulse, punching a hole in the audio. The characteristic of this circuit is also to widen the selectivity, so it should only be used in the presence of strong pulse interference. A definite trade-off situation.

Selectivity... This controls the width of "window" of frequency your receiver "sees." It is truly fortunate if your radio has such a control, as it's definitely in the top one-third. This control isn't a doorway, however. It's shaped like a bell and usually the reference markings only refer to 1 "S" unit or so -- no kidding!

Without going into dB rations, use the tightest (smallest) number that is comfortable to listen with. In other words, 2.4 kHz on AM isn't too extreme if you have interference and can understand the information.

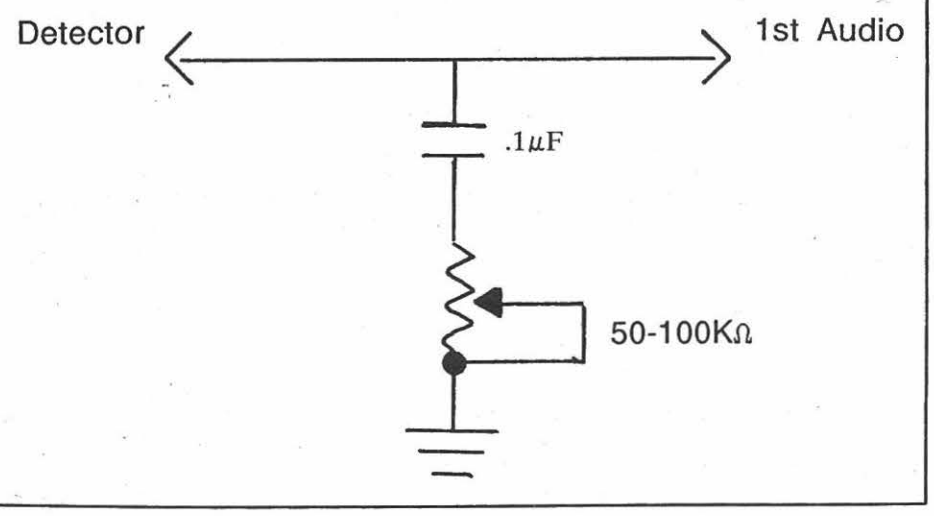
There is also exalted carrier reception, which requires a selectivity control. even if it's just narrow/wide for optimum results. (See BFO, next.)

BFO... This is an oscillator at the detector stage of the radio to restore the missing carrier on SSB, or, in the case of code (CW), and FSK (frequency shifting on radio teletype), to allow an audio tone to be produced so the information may be recovered. I'm aware you already knew that.

Perhaps you've also heard of "exalted carrier" reception, but never had an explanation. Well, here it is.

An AM signal consists of a constant carrier wave or signal with two identical side bands (upper and lower) on each side. Turning your BFO on and putting the control at 10:00 or 2:00 as you do to receive SSB, tune an AM signal to 'zero beat' (no tune). Depending on your BFO (or USB/LSB switch, which sets automatically), setting you are now only receiving one half of the signal.

Figure 1
"Tone Control"



Remember, each "half" is identical. Why on earth would anyone do this, you ask.

Lemme tell ya. Let's say you're listening to a station on 11.800 MHz and are getting interference from a station on 11.805 MHz. A station on international shortwave is usually about 8 kHz wide (4 up, 4 down). Aha! What if we tune to the lower frequency side of our station? Why, we move away from the interference. Unless there's a strong station on 11795, which unfortunately can happen a fraction of the time, your station is in the clear!

Remember, your BFO control must be "offset", not at 12:00 for this technique to work properly. Also, you want to use some SSB.CW or "narrow" selectivity setting for truly great results. On some receivers with an USB/LSB-CW switch, the selectivity is narrowed automatically. The Yaesu FRG-7700 is an example of this. There are others.

Tone control... Is this guy nuts? He said he wasn't going to talk down to me.

I'm keeping my promise -- the manufacturer is lying through his teeth. It isn't a tone control, it's just a treble cutter. No more, no less. (See figure 1.) It is so useless that you usually put it at about 50/50, scratch your head and never touch it again.

It does have a dandy, ready made hole for a notch control, though. Now there's a function that really does something. If you have a notch control, the proper way to set this thing is to disconnect the antenna, set the control fully clockwise, run up the volume and then turn it CCS until the internal hiss of the radio drops perceptibly. Then, never touch it again.

Notch Control... This is a function found on just a few sets, but it has been around for close to 40 years. What this does is "plow" a deep groove over a range of 6 to 10 kHz to knock out heterodyne (beat tone) interference and other types of RF commotion that are trying to ruin your day.

The most important thing to remember about this control is the fact that its doesn't know who the enemy is. So do not ever leave it at 12:00. Park it at 3:00 or 9:00. Otherwise, you'll wonder just who the wizard is that has the capability of trashing every station on the air. No mystery now.

"S" meter... This is a nice little meter that adds class, ease of tuning and a relative indication of signal strength. There is an industry standard that is conspicuous by its absence, stating that "S" 9 equals 50 uv (microvolts). If you have access to a laboratory grade signal generator, it's helpful to set the "S" meter to this standard at about 10 MHz. Don't bother to check it afterwards at 1 or 30 MHz as it will be off and you'll just wind up chasing your tail around a tree trying to equalize it.

Outside of maximizing the antenna trimmer or preselector control on the frequency in use, the tuning, range and volume are self explanatory. Any questions with an S.A.S.E. will receive a personal reply. Enjoy. ■

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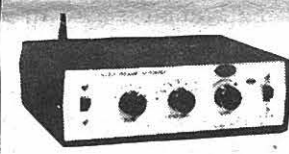

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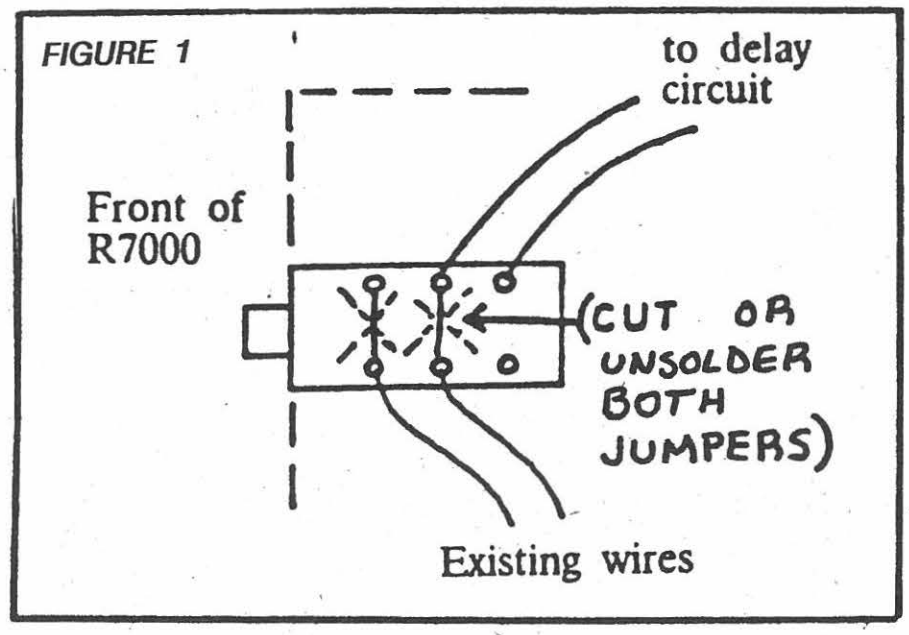
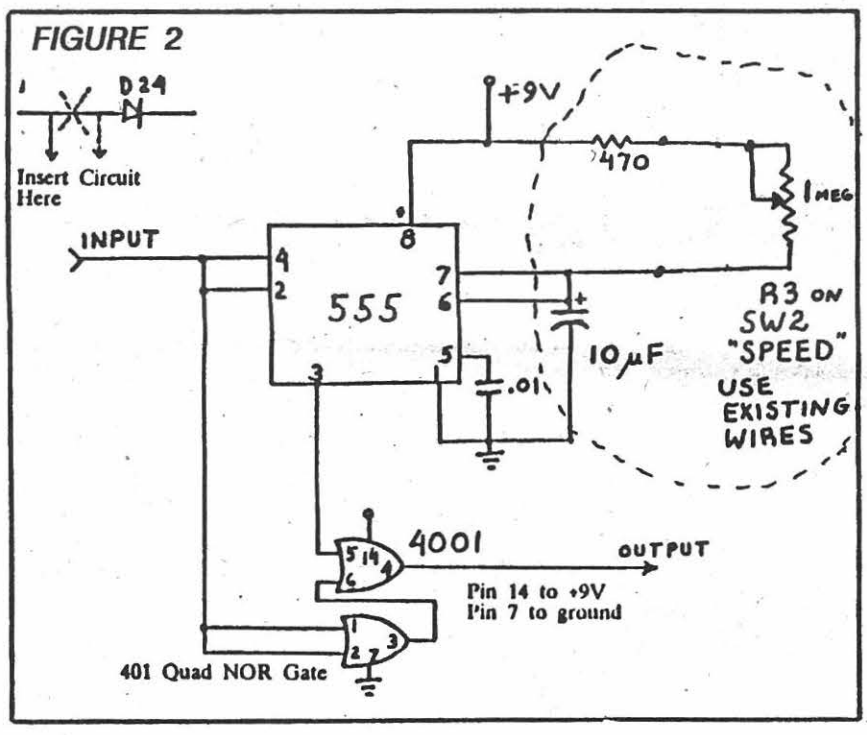
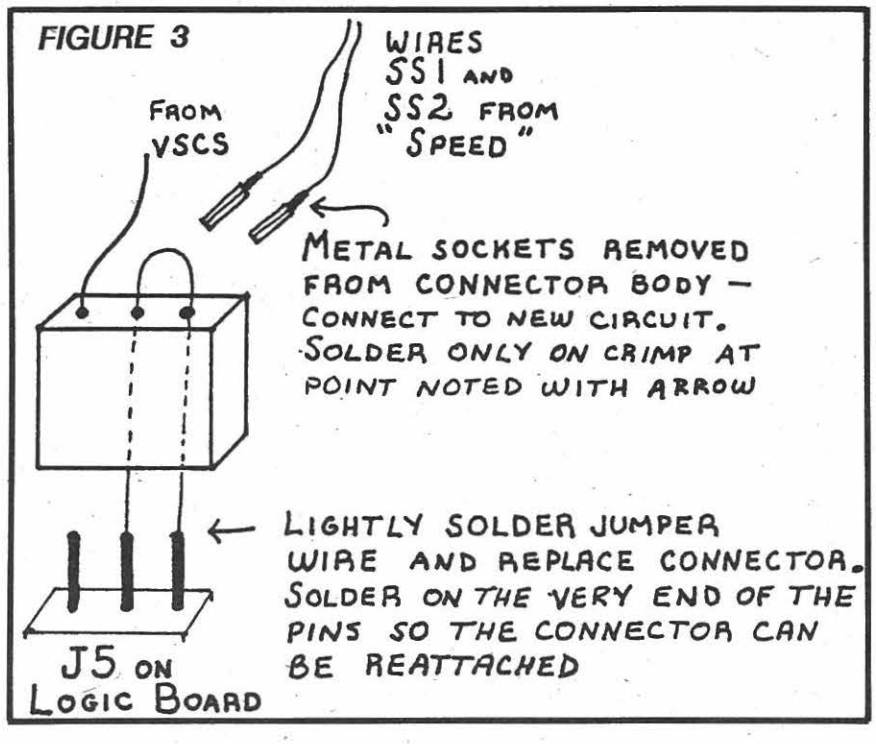
Scan Delay Improvements for the ICOM R7000

by Jim Dantin
1522 Springdale Drive
Owensboro, KY 42301
502-926-8333/927-6921







First Things First

We owe a sincere thanks to David Cook for providing us with a solution to the R7000's scan delay problem (*MT*, July 87). Having installed the mod, I can report that the receiver finally acts like one would expect it to! As Bob Grove commented in the July issue, the lack of a normal scan delay is the major source of dissatisfaction with the R7000.

The R7000 is an enthusiast's machine. Just like sports car owners are forever trying to "tweak" their machines for the ultimate in performance, we R7000 owners tend to look for ways to improve on ICOM's design. Starting with simple mods to speed up the scanning rate, we have now progressed to making functional changes in the circuitry! Each month, we anxiously await the arrival of *Monitoring Times* to see what new trick someone has discovered.

Installing the Mod

As soon as I read David's article, I high-tailed it over to Radio Shack to pick up the required parts. Since my R7000 hasn't seen its case screws since it was about one day old, it didn't take long for me to dive inside and check out what I was getting into.

David's comments about the VSC switch being in cramped quarters are distressingly true. Unless you're quite steady with a soldering iron (or have some experience in brain surgery), you're going to be intimidated by the job facing you.

The only sure way to get to the VSC switch is to completely disassemble the front panel. I took the lazy way out and only scorched a <u>few</u> wires! What I did learn, however, was a way to avoid the problem completely.

Problems with the Circuit

After installing the circuit and making the modifications to the R7000, I was faced with the usual problem of things not working as they should. With VSC pushed in, the R7000 worked normally, but with it out, it wouldn't resume scanning. A couple hours of rechecking the circuit and mumbling under my breath resulted in the discovery that the VSC switch was introducing noise or some stray voltage into the scan delay circuit.

That problem was remedied by cutting the second wire on the VSC switch -- remember David's explanation of the VSC switch being a DPDT with both poles shorted? He told you to snip the center wire. I found that you have to cut both of them -- fully isolating the two sides of the switch (see figure 1). The modified schematic shows you where to cut. Stick with me for a few more paragraphs, however, and I'll show you how to avoid the VSC switch completely!

Improving the Improvements

The only reason for using the VSC switch as a defeat is to prevent the new scan delay from clashing with the VSC. If the VSC resumes scanning while the scan delay is trying to hold up the scan, things tend to get confused and not work (was that too technical?). Nothing smokes, it "just don't work!"

For those of you without the steady hands and keen eyesight of your youth, I present the following alternative. Can you live without a scan "Speed" control? Mine hasn't known any position other than full clockwise -- who needs slow scan? I decided that a variable scan delay would be <u>much</u> more useful!

The speed control, R3 on the front panel, is a 1 meg variable resistor. In David's circuit, he uses a 2 meg resistor to give a four second delay; how about a variable delay up to around 15 seconds? Just change the timing capacitor from 2.2 microfarad to 10 microfarad, and use the speed control in place of the 2 meg resistor. This eliminates the need for the VSC defeat, since all you have to do is turn the speed control full clockwise for no delay! You now have variable delay and no need for microsurgery!

The Details

Take a look at the modified circuit drawing from David's article (figure 2). First, note the connection points for the speed control; the 470 ohm fixed resistor is still in the circuit as a current limiter -- if you omit it, you <u>will</u> damage the speed control! When the speed control is fully clockwise, it would have presented a direct short for the 9 volt supply to the 555 -- resulting in expensive smoke! The resistor safely prevents this disaster.

Next, refer to figure 3 to see how to connect to the speed control. By disassembling the connector at J5 on the logic board, you can reroute the wires from the speed control to your new scan delay circuit. Just follow the wires back to the front panel to identify the two correct ones.

After removing the metal contacts from the body of the connector, fabricate a short (four inch) piece of insulated wire into a jumper as shown on the sketch. This jumper is soldered to the pins on the logic board in place of the wiring from the speed control. By routing the jumper through the now-empty holes in the connector before soldering, you will be able to reattach the connector to the logic board.

Route the speed control wires onto the accessory tray and solder to the wiring leading from the delay circuit. I was careful to solder to the crimped part of the metal connectors so the R7000 could be easily restored to original condition later.

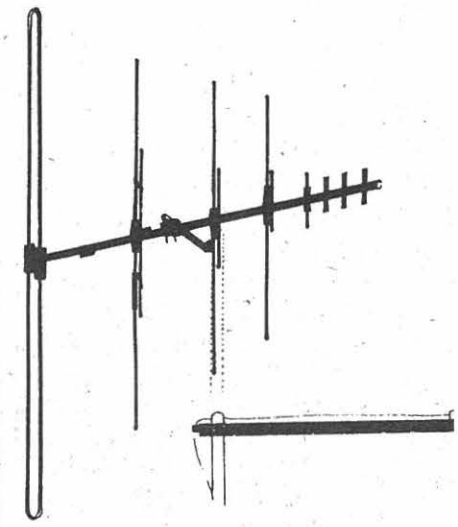
Mount the delay circuit on the accessory tray, being careful to insulate it from shorts -- I used a layer of electrical tape, but double-sided foam might work better. Remember that the accessory tray is on the bottom of the R7000, so your mounting will have to hold the circuit securely!

The Results

I now have a customized R7000 with a speedier scan rate, adjustable scan delay, dim display and meter for night use, modified earphone plug to eliminate hiss, and an accessory power outlet to power my Grove antenna amplifier. What ya' got under the hood in yours?

Let's keep up the information exchange in these pages. Those of us with burned fingers and solder smoke in our eyes can boast that we've picked up where the ICOM engineers left off. Until ICOM decides to come out with an R7100 (or would that be an R7001?), we have the opportunity to tweak the R7000 into a technological marvel with the consumer features we want. ICOM said scan delay was impossible -- nothing's impossible, it just might take a little longer!

Experiments with the Grove Scanner Beam



Several years ago Grove Enterprises introduced their Scanner Beam I, an innovative directional "beam" antenna for serious scanner listeners who wanted to extend their listening range. Later, the original design was improved to enhance 30-50 MHz low band performance as well.

Bill Cheek, president of Commtronics Engineering in Lemon Grove, California, and publisher of the *Eleven Meter Times Journal*, recently offered to do an objective, independent review of the Scanner Beam II if we would report his results to *MT* readers regardless of his findings. We agreed.

Reprinted below is the distillation of Bill's findings, good and bad. We are grateful to Bill for his dedication to the task and for his thorough procedure.

The Setup

Four configurations were erected and tested: a standard Scanner Beam, a modified Scanner Beam (rear low-band element cut off), a Grove OMNI antenna, and two Scanner Beams stacked and phased (side by side).

The stacked beams were separated 7 feet, 1 inch, using a length of 3/4-inch copper water pipe as the cross boom. Phasing lines were two Radio Shack #15-1529 4-foot, 75-ohm coax cables with push-on F connectors, both fed into a Radio Shack #15-1141 hybrid VHF/UHF TV splitter/combiner.

The test receiver was a Realistic PRO2002 scanner with the AGC line fed to a calibrated voltmeter. The targets were six transmitters in the San Diego region in the high and UHF frequency bands and a test oscillator (34.925 MHz) at 200 feet distance, used because of the instability of distant low-band signals.

Signal level readings were taken one at a time as antennas were alternated atop a 25-foot pole; front-to-back ratios were also measured with the three directional configurations. Gain figures in decibels (dB) were then calculated and listed in the accompanying table.

Some Brief Conclusions

The performance of the phased array was very impressive. The sharp forward directivity was accompanied on most frequencies by a sharp null on either side of the maximum signal. Dramatic front-to-back ratios and remarkable improvement in sidelobe rejection were noted as well, making it particularly useful for rejection of unwanted signals and an exciting prospect for further research and development efforts.

There is no increase in gain using two Scanner Beams over one, however, and the main lobes were rarely in line with the axis of the array, making it useless for direction finding. None of the configurations was particularly suitable for low band monitoring*.

**Ed. Note: All scanner antenn presently on the market are physica short for low band reception; resonant 30 MHz dipole would nearly 16 feet tall, too cumbersome the majority of installations. T Scanner Beam is comparable to ot multiband antennas for low ba monitoring.*

RECEIVED SIGNAL LEVELS

Frequency	Scanner Beam II (Standard)	Scanner Beam II (Shortened)	ANT-1 Omni	Scanner Beam II Stacked Pr
34.925 MHz	F: 2uV	F: 1uV	3uV	4uV
	B: 2uV	B: 1uV		2uV
	F/B: 0 db	F/B: 0 db		6 db
	G: -3 db	G: -9 db		2 db
125.45 MHz	F: 10uV	F: 9uV	3.2uV	9uV
	B: *	B: *		*
	F/B: *	F/B: *		*
	G: 10 db	G: 9 db		10 db
126.60 MHz	F: 3.2 uV	F: 2.8 uV	2.0uV	3uV
	B: *	B: *		*
	F/B: *	F/B: *		*
	G: 4 db	G: 3 db		4 db
132.35 MHz	F: 57uV	F: 50uV	2.5uV	64uV
	B: 16uV	B: 8uV		1.5uV
	F/B: 11 db	F/B: 16 db		33 db
	G: 27 db	G: 26 db		28 db
162.40 MHz	F: 31uV	F: 28uV	22uV	44uV
	B: 8uV	B: 7uV		< 1uV *
	F/B: 12 db	F/B: 12 db		>>33 db *
	G: 3 db	G: 2 db		6 db
453.95 MHz	F: 10K uV	F: 9K uV	3500uV	10,000 uV
	B: 850uV	B: 972uV		90 uV
	F/B: 21 db	F/B: 19 db		41 db
	G: 9 db	G: 8 db		9 db
Averages:	F/B: 11 db	F/B: 12 db	n/a	>28 db
	G: 8 db	G: 6 db	n/a	10 db

NOTES:

F = Front of antenna
B = Back of antenna
F/B = Front-to-Back Ratio
G = Forward Gain (db) of antenna relative to the Omni antenna
* = Below limits of measurability
> = Greater than...
>> = Much greater than....
< = Less than

"ASK BOB"

Bob Grove, WA4PYQ
P.O. Box 98
Brasstown, NC 28902

Q. How does one specify the filter bandwidth, in a receiver for listening to radioteletype? (Fred White, St. Augustine, FL)

A. While it's a simple matter to choose a single filter for most CW (Morse code) and single sideband (SSB) and even AM voice, all depending upon how crowded the band is, selecting an RTTY filter is a little more complicated because of the number of speeds and shifts.

We contacted an expert for this one: Al Chandler at AEA in Lynnwood, Washington. According to Al, the filter bandwidth in hertz is equal to three times the baud rate, then add the shift. For example, a 75 baud (100 WPM), 425 Hz shift signal would need to pass through a 650 Hz bandwidth filter.

This value is ideal, of course, and in the real world we don't have ideal filters. For most applications, use the next higher bandwidth available for the RTTY application, probably an 800 or 1000 Hz filter for the example above.

Q. Where can I find a service manual for my Bearcat DX-1000 general coverage receiver? All I can get from Uniden is a schematic. (Michael Avinor, Albuquerque, NM)

A. I'm afraid you will have to settle for the schematic; Uniden assures me that there has never been a service manual for the DX-1000.

Q. Why doesn't MT review Heathkit products? If their general coverage receiver is as good as the Yaesu or Kenwood I'd probably buy it instead, but there's no unbiased reviews to compare. (Izak Luchinsky, Baltimore, MD)

A. We would be happy to provide this free promotional service for Heathkit and have contacted them on several occasions; unfortunately, they have refused to send any factory-wired products for us to test. We have to assemble their kits ourselves and we can't justify the personnel when there are so many other reputable companies willing to send a completed product.

Q. Are there any modifications or programming tricks for the Realistic PRO-2004 scanner or the Regency HX1200 hand-held scanner? (Michael Fischback, Mapleshade, NJ)

A. Realistic (Radio Shack) scanners contain dedicated microprocessors which cannot be tricked into widening their frequency coverage. This continues to be true for the PRO-2004, by far the best scanner Radio Shack has ever introduced and quite possibly the best scanner ever released to the consumer market.

Like many Regency scanners, the HX1200 will accept frequency commands outside of its advertised limits. If the frequency error prompt comes up, no signal will be received even though the radio will take the entry. It is possible to retune the radio for those "outer limits," but it may be at the expense of sacrificing performance in normal ranges.

Q. How do the receiver sections of amateur transceivers compare with general coverage receivers from the same manufacturers? (John Zander, Jamesville, MN)

A. Years ago the answer would have been different, but modern general coverage receivers are usually the same circuitry as found in comparable transceivers from the same manufacturer. My Kenwood TS440S receiver section, for example, is the same circuit as found in the R5000. The same observation applies to products from Yaesu and ICOM.

Q. How do I connect a Sony AN-1 active antenna to a Panasonic RF3100 receiver? (C. A. Luse, Lee's Summit, MO)

A. Since the RF3100 has two terminals, one for an antenna and one for a ground, you must improvise an adaptor for the recently-discontinued AN-1. If you use the 1/8" plug on the AN-1, mate it to a jack (available from Radio Shack) to which two wires have been soldered, one for the tip of the plug (this goes to the antenna jack of the radio) and one for the barrel of the plug (this goes to the ground terminal).

Q. What difference in reception can I expect when I switch from the plug-in whip that came with my scanner to an outdoor antenna? (C. A. Luse, Lee's Summit, MO)

A. Quite a bit. Indoors you are lower, the whip is smaller, nearby metal produces signal-cancelling reflections, electrical appliances produce interference, and building construction can shield the set from signals.

An outdoor antenna will provide greater range, possibly on the order of 100-200% further than the little indoor whip. In the clear and in flat, unobstructed terrain it is possible for a good rooftop scanner antenna to receive base station signals 75-100 miles away and mobiles at 10-25 miles or more.

Q. Who are the companies who are trying to take scanners and their frequencies away? (Gene Perryman, Kendrick, OH)

A. No companies are trying to ban scanners, and only one company (Radio Shack) has limited frequency coverage to thwart interception of cellular telephone calls.

Q. Can scanner lockup (where two side-by-side scanners interfere with each other's scanning sequence) be helped by lining the inside of the plastic scanner cabinets with metal foil? (David Smith, Clarksville, IN)

A. Perhaps partially. Be sure to cover as much of the front, sides, top, and bottom surfaces of the cabinet as possible and connect the foil at several points to the circuit board common ground foil. Stay away from the 120VAC wiring, however, on scanners which plug directly into the wall socket!

Q. Lightning has zapped my solid-state shortwave receiver; where can I find a good, used tube-type radio like the Collins R388 or National NC188? (Allan Easton, St. Anthony, IA)

A. The market on tube-type receivers has just about dried up. Try the larger amateur radio dealers who advertise in *MT* and the ham magazines, and also contact surplus outlets like Slep Electronics (Highway 441, Otto, NC 28763; ph. 1-704-524-7519) and Fair Radio Sales (1016 E. Eureka Street, Lima, OH 45802; ph. 1-419-223-2196). You may also wish to place a classified ad in *MT*.

Q. How do I know whether to use the low impedance (50 ohm) or high impedance (500 ohm) antenna terminals on my shortwave radio? (Barry Rader, Fostoria, OH).

A. Use the low impedance terminals with coax line or with any random wire under 100 feet or so in length. The high impedance input might be used with a longwire at higher frequencies (like 200 feet at 10 megahertz) for closer impedance matching. In virtually every practical installation, use the low impedance connection.

Q. Recently I saw ads for hand-held devices which could show stock market reports and sports scores, up to the minute. How do they work? (William Ritz, Cleveland, OH)

A. In many large cities, FM broadcasters utilize subsidiary carrier authorization (SCA), whereby they transmit a subscriber service right along with their normal broadcast programming. A special narrowband selectivity receiver (or converter) is required to extract this second service from the wideband carrier of the primary broadcast service.

In the past it was legal to tap into SCA to receive background music, talking books for the blind, and many other interesting phantom users; but the Electronic Communications Privacy Act (ECPA '86) now forbids such unauthorized reception. ■

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Larry Miller

3 Lisa Drive
Thorndale, PA 19372

ESP and ECPA!

I recently returned from a very pleasant vacation at the New Jersey shore. While there I witnessed an amusing occurrence that I feel compelled to share with you and your readers.

While on the beach on morning, my wife and I noticed a family of four stake their claim to a spot not far from out blanket. Besides the usual trappings, the man carried what appeared to be a portable cellular phone. "So what else is new?" I thought.

Later in the afternoon, "Mrs. Cellular" and the kiddies packed up and headed off the beach to parts unknown, with "Mr. Cellular" observing. As soon as they were out of sight, the guy fired up his 'phone and put through a call. About a half hour later, a rather attractive, bikini-clad woman appeared and greeted the guy in a more than casual way. Of course, my wife was observing all this and when she turned toward me, she saw my cheshire-cat grin.

Yes, without the aid of a scanner, I feel reasonably confident that I was able to "tune in" on that conversation! But what of the FCC Thought Police! Am I in danger of a violation of the ECPA?! I had better be careful in the future.

P.S. I asked my wife for a cellular phone for Christmas. Guess what she said?

Ed Cichorek
Somerset, NJ

SX-400/GTI Spectra Display

In regards to your answer to a question on page 58 of the August issue of *MT* which refers to outputs for the GTI Spectra Display. It may interest you to know that the JIL SX-400 not only has a 10.7 MHz output but a 455 kHz output. I don't know if these radios are still available as "new from the dealer," but there are certainly many of them in circulation.

Keep up the good work on *MT*; you definitely have the definitive publication for listeners to the radio spectrum.

R. Kemp
L.H.P., Florida

Blimp Blooper?

(With reference to the August editorial, "Things that go bump in the night")...Sounds to me like Bill saw a blimp. Check to see what frequencies Goodyear uses. It won't be the first time a blimp has been reported as a UFO.

Larry Lopez
Houston, TX

MT Doing it Right!

In regards to the letter from Henry Gorman - "articles - written at the entry level of intelligence - most of us know how to put up an antenna." I'm just a beginner. I'm retired and now I have time to be a beginner in a lot of things and my stepson, who is just getting started in monitoring, put me

CONVENTION CALENDAR

Date	Location	Club/Contact Person
Sep 5-6	Shelby, NC	Shelby ARC/ Dale Mauney WA4BBN 1158 E Marion St, Shelby, NC 28150
Sep 12	Uniontown, PA	Uniontown ARC/ John Germak WB3DOD P.O. Box 433, Republic, PA 15475
Sep 12	Niagara Fls,NY	Tonawandas ARA/ Bert Jone W2CUU 143 Orchard St, Kenmore, NY 14223
Sep 12	Windsor, ME	Augusta Emergency ARU/ Phillip Young W1JTH 47 Longwood Ave, Augusta, ME 04330
Sep 12	Ballstn Spa,NY	Saratoga Co ARC/ David Atwell N2FEP Ballston Spa, NY 12020
Sep 12-13	Mobile, AL	Mobile ARC/ Warren McCarty KB4JET Rte 4 Box 514, Grand Bay, AL 36541
Sep 12-13	Louisville, KY	Greater Louisville/ Robert Karr Rt 5 Forest Hill Rd, Shepheardsville,KY 40165
Sep 13	Monett, MO	Ozarks ARS/ Gary Meyers, KYOB 1201 Madison, Aurora, MO 65605
Sep 13	Carbondale,IL	Shawnee ARA/ Mike Hoshiko W9CJW 707 S. James St, Carbondale, IL 62901
Sep 13	Butler, PA	Butler Co ARA/ John Varljen K3HJH 174 Oak Hills Hts, Butler, PA 16001
Sep 13	Danbury, CT	Candlewood ARA/ E.L. Marino W1IDH 31 Valley View Dr Rd, Newtown, CT 06470
Sep 13	Gaithersbrg,MD	Foundation for Am Rad/ Robert Moore N3CKD 9449 Mayflower Ct, Laurel, MD 20707
Sep 13	Willow Spgs,IL	Bollingbrook ARS/ Ed Weinstein WD9AYR 7511 Walnut Ave, Woodbridge, IL 60123
Sep 18-19	Watertown, SD	Dakota Div Conv/ Darwin J. Hegg RR3 Box 96, Watertown, SC 57201
Sep 19	Sobastopol,CA	Sonoma Co ARC/ Alan Bloom N1AL 1576 Los Alamor Rd, Santa Rosa, CA 95405
Sep 20	Pennsauken,NJ	S.Jersey Radio Assn/ Fred Holler W2EKB 348 Bortons Mill Rd, Cherry Hill, NJ 08034
Sep 20	Old Westbry,NY	Long Island Mobile ARC/ Henry Wener 53 Sherrard St, East Hills, NY 11577
Sep 20	Mt Clemens, MI	L'Anse Creuse ARC/ Robt Macauley WB8WVF 21216 Danbury, Mt Clemens, MI 48043
Sep 27	St Peters,MO	St. Peters ARC/ Jason Awyers KA0INR 1084 Crestwood Ln, O'Fallon, MO 63366
Sep 27	Gainesville,GA	Lanierland ARC/ Philip Loveless 4949 Red Oak Dr, Gainesville, GA 30506
Sep 26-27	Walla Walla,WA	Walla Walla Valley RAC/ B.Frazier WA7CBX 610 S First, Walla Walla, WA 99362
Sep 26-27	Des Moines, IA	Midwest Division/ Bob McCaffrey K-CY 3913 29th, Des Moines, IA 50310
Sep 26-27	York, PA	Hilltop Transmitting Soc/ Wm. Boyer W3AMQ 21 S. Findlay St, York, PA 17402
Sep 27	Berea, OH	Cleveland Hamfest Assoc/ Glenn Williams AF8C 513 Keneliwith Rd, Bay Village, OH 44140
Sep 27	Willimantic,CT	Natchaug ARM/ Richard Grillo KB1XL 393 Prospect St, Willimantic, CT 06226
Sep 27	Cafield, OH	Twenty-Over Nine ARC/ John Tarr N8GUB 3452 Lenox Ave, Youngstown, OH 44502
Oct 4	Watertown, CT	Waterbury ARC/ Gary Firtick K1EB 589 Hamilton Ave, Watertown, CT 06795
Oct 3-4	Virginia Bch,VA	VA State Convention/ Art Thiemens AA4AT 2836 Greenwood Rd, Chesapeake, VA 23321
Oct 3-4	Bilox, MI	MS Coast ARA/ Jan Carlson N5FYO Rt 5 Box 242, Biloxi, MS 39532
Oct 4	Howard Co, MD	Columbia ARA/ Edward Wallace K3EF 9905 Carillon Dr, Ellicott City, MD 21043
Oct 4	Yonkers, NY	Yonkers ARC/ John Costa WB2AUL 195 Woodlands Ave, Yonkers, NY 10703
Oct 4	Springfield,OH	Springfield OH IRA, Stephen Klipfel KA8QCS 825 S. Tecumseh Rd, Springfield, OH 45506
Oct 4	Utica, MI	Utica Emerg Comm Ass/ Harold Henry KA8UZQ 53062 Tundra, Rochester, MI 48087
Oct 2-4	San Jose, CA	Pacific Div Conv/ Emmett Freitas AE6Z 481 Fenley Ave, San Jose, CA 95117
Oct 4	Rome, GA	Coosa Valley ARC/ Bobbie Waller KA4DXU Rome, GA 30161
Oct 9-11	Atlanta, GA	SE DX Club/ Carl Henson 8280 Chestnut Dr, Jonesboro, GA 30236
Oct 9-11	Scottdale, AZ	SW Div Conv/ Jim Cushing KD7FW 4414 E Ludlow Dr, Phoenix, AZ 85032
Oct 10-11	Warrington, PA	Mt. Airy VHF RC/ Gary Hitchner WA2OMY 39 W. Mt Kirk Ave, Norristown, PA 19403
Oct 10-11	Wichita, KS	Kansas State Convention/ Gary Vreeland ND0T 1920 S. Santa Fe, Wichita, KS 67211
Oct 10-11	Memphis, TN	Mid-South ARA/ James Alexander AA4OU 2969 Iroquois, Memphis, TN 38111
Oct 10-11	Warner Rob,GA	Central GA ARC/ Clifford Warrick N6DLA Warner Robins, GA 31098
Oct 11	Maysville, NC	Maysville Hamfest/ JoAnn Taylor WD4JYR Rt 1 Box 80-36, Swansboro, NC 28584
Oct 17	Gray, TN	Johnson City & Kingsport/ Wendell Messimer 512 W. Poplar St, Johnson City, TN 37605
Oct 17	Syracuse, NY	Radio Am of Gtr Syracuse/ Vivian Douglas 213 Monticello Dr So, Syracuse, NY 13205
Oct 24-25	Chattanooga,TN	TN State Conv/ Gary Kendrick KW4Z 3107 12th Ave, Chattanooga, TN 37407
Oct 25	Grandview, MO	South Side ARC/ Linda McLeod KA0SEU 1603 Richmond, Pleasant Hill, MO 64080
Oct 31-Nov 1	St Charles,IL	Central Div Conv/ George Isley WD9GIG 736 Fellows St, St Charles, IL 60174

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on to *Monitoring Times* a few months ago. If I can get advice from an expert on how to put up an antenna I'll be glad to listen because I don't really know how.

I appreciate the fact that a lot of your items are written for entry level people - fact is, if you didn't have it at my level I wouldn't have subscribed to *MT*. Being old and retired isn't all that bad as long as people like you keep giving us fun things to do. Keep up the good work.

Philip Beltz
Uhrichsville, OH

Read a lot about connectors and their numbers - finally! Someone put them together with pictures. That's why *MT* is the best!

A.W. Goodman
Elkins Park, PA

This is just a quick note of thanks for a continued, superb publication. I'm glad you did not scratch the Ham Bands info. While I am not a ham it makes for interesting reading. I look forward to Larry Van Horn's information each month, and this month was really good. You guys keep up the good work.

Lloyd Scott, Jr.
Bartow, Florida

More Las Vegas Excitement

Just thought I'd send you a note of some of the interesting radio traffic in the Las Vegas area over the past two weeks.

August 1st

A single engine plane carrying four people from Alaska crashed about 50 miles from Las Vegas, all four died instantly. Metro police responded using ch. 7 (for rural patrol) and the channel for search and rescue 155.370.

A fire started when the plane crashed. BLM used 419.625 for fire operations with the air tanker on 122.900.

August 6th

A single engine plane carrying one person came down in Las Vegas less than 100 feet from an apartment complex, knocked over a power line, then crashed 50-100 feet from a busy intersection right at lunch time. The pilot died on impact.

Metro police used ch.2 (south patrol) 159.090, search and rescue channel (above), and Las Vegas fire dept. ch.3 453.700 and ch.4 453.400. Local news media were also heard setting up live reports from the crash scene on 450.250 (TV-8 CBS) and 450.6125 (TV-13 ABC) in addition to the radio news station KNUU which used 161.700.

August 8th

On the TAC channel from Nellis AFB (381.300) and C-130 using the call sign "Cast-31" ran a phone patch through Raymond 22 to Discard (Travis AFB 22nd AF operation) to report they had to shut down the #3 engine due to a "generator out" light on #3.

August 6 & 9

Several antinuclear groups protested at the Nuclear Test Site about 65 miles north of Las Vegas. Test site security used 167.825 and were assisted by the Nye Co. Sheriff's office who arrested over 100 people; they were using 155.625. Some seemingly related traffic was heard on 145.550 (amateur allocation) which sounded like press updates and information relating to logistics the protesters would talk about.

The groups involved were the American Peace Test and the Nevada Desert Experience. Meanwhile, the test site continues to use 173.5125, 173.6125 and 173.7125 for dry runs and preparations of nuclear tests.

Todd Shideler
Las Vegas, NV

(See Todd's article on the Nellis Air Crash for more!)

It Takes All Kinds

In the August issue of *MT* in the communications loggings you noted that you would like to have more shortwave loggings than local scanner loggings. I, for one, like to see both local and shortwave loggings, as I put the local loggings that I can use into a notebook for use later.

In every issue of *MT* there are stories about local events, such as the Pan Am Games, and I don't think I can hear much of the comms from the games.

In closing I hope that you will still accept scanner loggings along with shortwave, as I think both loggings are of use to us ute's.

Bernie Wimmers
Vienna, VA

(By all means...Bob) ■

SIGNALS FROM SPACE
continued from p. 26

The transponder power outputs are 5 watts; these birds should be very loud. No operating schedule has thus far been announced. There is some concern that the primary payload, Cosmos 1861, which has a 150 MHz downlink, is interfering with RS-10 and RS-11's 2 meter receiver. This may drive the operating schedule in favor of Modes K and T with their 15 meter uplinks and away from Mode A with its 2 meter uplink.

Telemetry is sent in CW. It represents various status indicators and measurements made on the transponders. There are 16 channels sent. Each channel sent is in the format of 2 alpha characters followed by 2 numeric characters. For example, "IG35." The "IG" part is the alpha and the "35" is the numeric part of each channel. The alpha part gives a specific status such as "on" or "off" for X specific feature. The numeric part gives a value for a variable of interest such as temperature of the 10 meter transmitter.

In the example, IG35, the "IG" pa gives specific status for channel 4, MHz receiver status. "IG" means tl 21 MHz receiver is off. If, howeve "IG" is replaced by "NG" in chann 4 as in "NG35", then the 21 MI receiver is activated. The numer part of channel 4, "35" in o example, gives the AGC level on tl 15 meter receiver where the value volts equals the number sent divid by 5. That is, volts = N/5 or 35/5 = volts (see table on p.26).

The Soviet News Agency, TASS, sa the primary payload, Cosmos 186 was intended to work within tl space navigational system with tl aim of determining the position vessels belonging to the USSR's s going and fishing fleets at any poi in the world ocean. The system similar to the U.S. Navy Transit Na igational System. Cosmos 1861 probably part of the Soviet's Cica Navigational System. The navigatic part of Cosmos 1861 may also b used by UA3CR during his joi USSR-Canadian polar expeditic next winter. *(Information summarize from TASS/Radio Moscow/AMSA News Service.)*

STOCK EXCHANGE

NOTE: Monitoring Times assumes no responsibility for misrepresented merchandise.

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For Sale: NRD-515 with 96 channel memory, speaker, 500 kc filter, $1000, ICOM R-71A, 500 kc filter, oscillator, $650.00. Great for RTTY/SSB - 313/884-2382 after 2200 GMT.

For Sale: Mint ICOM R71A 1 year old $635.00 including UPS. Ed McAninch, 100 S 3rd St. Apt. 714, Martins Ferry, OH 43935.

For Sale: ICOM R71A, 15 months olds, options front endupgrade, audio mod, 4kHz filter, spike prot, -12v R71A kit, will toss in Eavesdropper ant kit, first $550.00 certified check or money order takes. W.E. Quigley, 826 Illinois Ave., Ottawa, IL 61350 (815-433-2722).

Sell: DRAKE R7 with noise blanker, 6K, 4K, 2.3K, 1.8K, and .5K filters. One year old. $900. SONY ICF6800W $400. Palomar BCB loop with amplifier $100. All as new. Augie Alfaro, 144 West Hillsdale, San Mateo, CA 94403 (415)571-0595.

HAMTRONICS Scanner Converter CVR-240 Model, pefect condition. Covers 240-270 MHz, $70.00. Contact John Eubanks, 3501 Castle Rock Dr., Joplin, MO 64801 (417) 624-2470.

For Sale: INFO-TECH M6000. New condition, factory manual and box. UPS to your door with full insurance. $699.00. Frederick White, 904-829-8175 after 2300 UTC. No collect calls.

For Sale: BEARCAT 800 XLT, 40 channel. Programmable scanner 800 MHz, $225.00 plus postage. UNIDEN CR-2021 programmable shortwave $100.00 plus postage. Both in excellent condition. Call 305-933-4677.

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YAESU FRG7700 with memory, excellent condition, manual; cost $550, sell $375 including shipping.

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Bob Grove, P.O. Box 98, Brasstown, NC 28902. Ph. 704-837-9200 weekdays.

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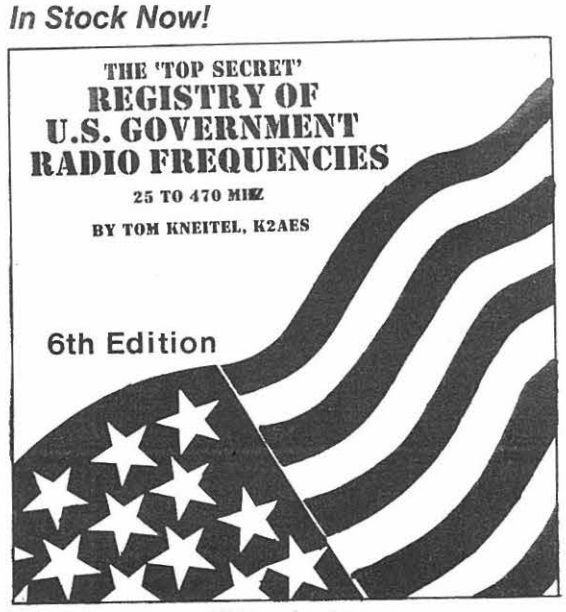

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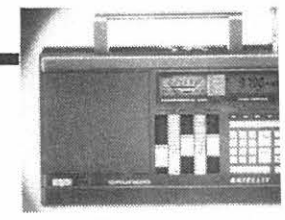

GRUNDIG SATELLIT 400

If you're a shortwave listener—not a DXer—and you're looking for the finest in listening machines, look at Grundig. Featuring legendary German engineering, the Satellit 400 is a listener's dream. It boast solid performance, attractive styling, lots of features and excellent a dio. In fact, this oversized portable is the best sounding radio in its class. You get full LW, AW, FM and shortwa coverage, keypad and rotary tuning (to 1 kHz), and a lar LCD frequency/time display. It's a remarkably sensative r dio, too, capable of receiving the weak stations. But you want to use it for the fine sound that it brings your regul listening. Finally, there's a shortwave radio for the listening connoiseur. It's the Grundig Satellit 400. Available nc for $399.95 plus $4.02 UPS. (10 lbs.)

EAVESDROPPER ANTENNA

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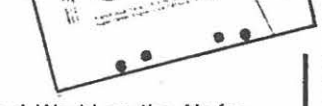

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Two great collections for the DXer! World on the Air features 65 minutes of jingles, station promos, commercials and program excerpts from broadcasters all across the globe. Latin America on the Air, a 75 minute cassette, which comes with a guidebook, samples stations in the Caribbean and South and Central America—some no longer even on the air! Each tape $9.95 plus $1.95 shipping. (1 lb.)

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SECRETS OF SUCCESSFUL QSLING

A complete, easy-reading and entertaining guide to reception reports and QSL collecting. $9.95 plus 1.95 shipping. (1 lb.)

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An invaluable guide for every shortwave enthusiast who wants maximum signal reception from his set up. A complete soup to nuts book that runs from how antennas work to how to build your own—from tested designs. A best seller. $11.95 plus $1.95 shipping. (1 lb.)

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Options. IC-R7000: RC-12 remote control, EX-310 voice synthesizer, CK-70 DC adapter, MB-12 mobile bracket. IC-R71A: RC-11 remote control, EX-310 voice synthesizer, FM module, CK-70 DC adapter, MB-12 mobile bracket, FL-32A 500Hz, FL-63A 250Hz, and FL-44A filters.

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